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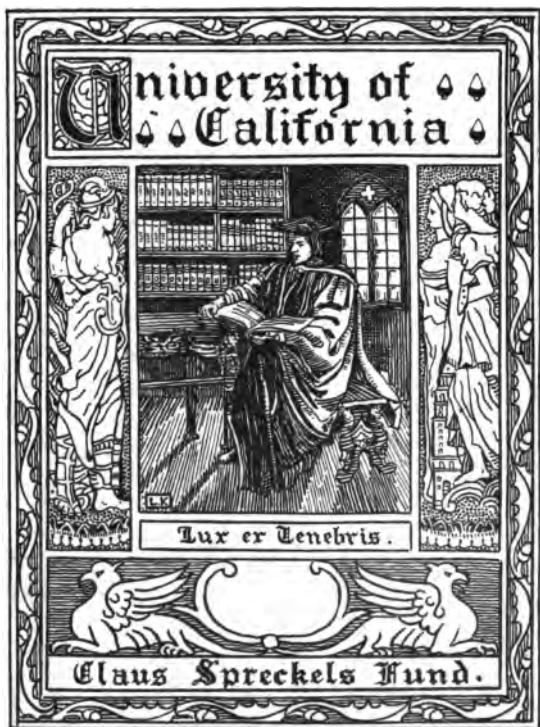
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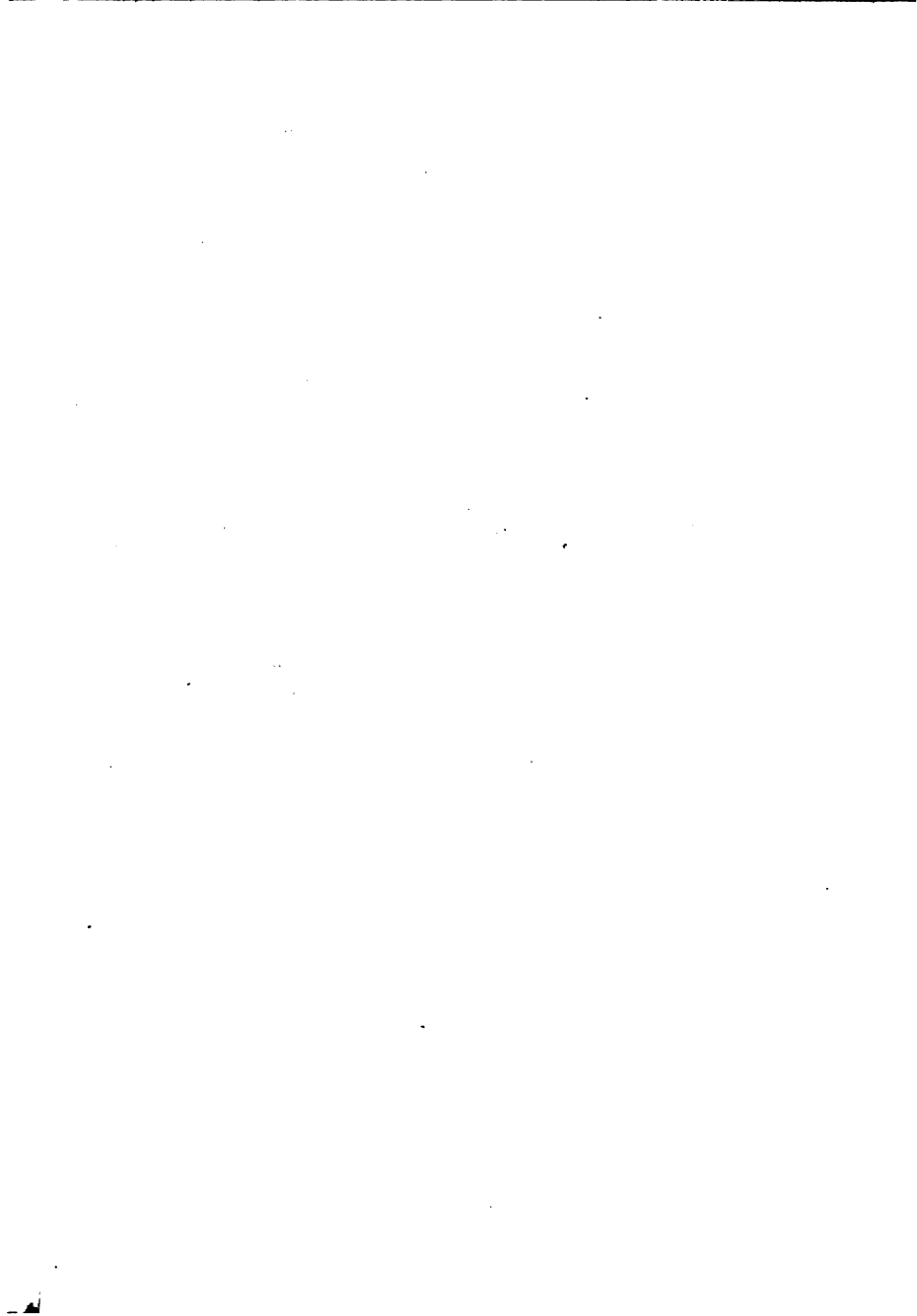
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The Increasing Gold Supply







THE INCREASING GOLD SUPPLY

**And Its Effect on SECURITY VALUES;
INTEREST RATES; COMMODITY
PRICES, Etc.**

Compiled from
**THOMAS GIBSON'S
SPECIAL MARKET LETTERS
1908**

WITH AN APPENDIX



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M.C.

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FOREWORD.

Interest in the letters bearing on the gold supply and its effects on security prices which have been issued from this office recently has been so great that I have decided to combine the views of several authorities in a single volume.

A correct understanding of this matter is of vital importance to every business man and particularly to the investor or speculator in bonds, stocks or commodities. Mr. Maurice L. Muhleman, Mr. Byron W. Holt, Mr. Arthur Selwyn-Brown, Professor J. Pease Norton and Mr. W. G. Nicholas, who are the contributors to this brief symposium, are all eminently capable of passing competent opinions on the subject.

As my personal study of the subject has been directed particularly to the speculative phase of the matter, I have produced a chapter on gold from a recent work.

THOMAS GIBSON



Gold Depreciation and Security Values.

By BYRON W. HOLT.

The big investors, speculators and property owners of the world are, as a rule, men of unusual intelligence and keenness. Besides being practical men of affairs they are usually somewhat close students of conditions and markets. They have learned how to solve all of the ordinary industrial and financial problems in a way to add to their property holdings.

In recent years, however—that is, since about 1896—a new factor has appeared in money-making problems that is so insidious and disturbing that it is confusing and confounding our wealth-getters, both great and small. Because of the influence of this very important new factor in upsetting many of the calculations of our actuaries, treasurers and auditors, not a few of the old lessons, rules and maxims for acquiring wealth will have to be unlearned or reversed.

For example, there is no more certain road

This article was specially prepared for the market letter service.

to wealth to-day than to go into debt—intelligently. Neither is there any more certain way to lose wealth than to become an ordinary creditor—that is, to own first-class bonds from year to year. To-day, the conservative who puts his money into government or other high-grade bonds will see his fortune vanish, while the reckless speculator who puts his money into heavily mortgaged real estate or the stocks of heavily-bonded industrial corporations may see his wealth multiply rapidly. If he buys these stocks on a safe margin, his wealth will multiply even faster.

To those who do not see, or do not understand, the new and great fundamental cause that is silently but surely and rapidly changing the ownership of wealth and overturning the conclusions of the past experience of wealth-getters, success or failure appears to be uncertain and a matter of blind chance. To some extent this may be true. Some investors and speculators may happen, ignorantly, to buy and hold the same classes of securities that they would buy and hold if they were acting intelligently; but this is unlikely. Those who know the good things from the poor things will almost certainly succeed in trading off the poor things for the good ones.

For example, ordinary investors are, perhaps, now selling more stocks than they are buying. They cannot understand why stocks

should continue to advance and to show such remarkable strength, in the face of existing facts or of any coming industrial improvement that appears probable to their ordinary minds. They think somebody is making a great mistake in buying stocks so confidently.

But, suppose the big somebodies who are now buying the stocks that the public is selling have their eyes open to some new facts and conditions that make it reasonably certain that business will revive so rapidly that stocks will be in great demand at high prices six months hence; who, then, is mistaken?

There are rumors that the effect of gold supply and depreciation upon security values has been a subject of discussion in recent conferences held in the offices of some of our greatest financiers. It is said that the conclusions there reached, at least in the minds of some of the participants, are likely to have far-reaching effects upon security prices. Mr. Howard S. Mott, the financial editor of Harper's Weekly, says, in the issue of August 29:

"There is no real 'new dogma' in this theory of the effects of gold depreciation. But the acuteness of some of the effects recently witnessed has led to earnest consideration of the problem it presents by many students of finance. It is quite conceivable that our captains of industry may be actuated in the 'wis-

dom' they are displaying at the present time by a good understanding of this problem."

In considering this gold problem several important questions were presented:

1. Will the gold supply continue to increase rapidly for years to come?

2. Does the purchasing power of gold decrease as the quantity of gold increases?

3. Assuming that gold will continue to depreciate in value (that is, that prices will rise), what will be the effect upon interest rates, bond values, earnings, stock prices, etc.?

The first question has been well answered by Mr. Arthur Selwyn-Brown in Thomas Gibson's Special Market Letter of July 28, 1908. As a mining engineer and expert, he reaches the conclusion, after considering the world's sources of gold supply, present mining methods and capital employed, and future probabilities as to new sources of supply and methods of production, that "We may confidently anticipate progressive yearly increases in production."

While there are some mining engineers who are less confident of the future than is Mr. Selwyn-Brown, there is good reason for thinking that his conclusion is entirely conservative. Gold production, in recent years, has been established on a very different and much more certain basis than that of 20 or 30 years ago. To-day the output is less dependent upon the uncertain output from placer mines and more

dependent upon the almost certain output from the inexhaustible supplies of low-grade ores in rock, sand and clay. Apparently, the only thing that can materially lessen the output of gold will be the increased cost of obtaining it, due to the depreciation of gold itself. If improvements in mining and metallurgical processes do not keep pace with the decreasing purchasing power of gold, there must, and will, come a time when, because of rising wages and rising prices of machinery and supplies, the cost of mining will so nearly equal the value of the gold produced that production will diminish.

The Wall Street Journal of June 5, 1908, expressed the opinion that "already, it may be said that the gold production is apexing," and that, "in the opinion of the leading mining authorities of the world," the output will begin to fall off in from three to five years. Unfortunately, the Wall Street Journal did not mention its authorities or give us their arguments. Had it done so, it might be possible to show that these same authorities have been advancing these same arguments for ten or twenty years—arguments that have been already disproved by facts. One of these authorities may be the writer in the Engineering and Mining Journal of June 27, 1908, who said:

"It has been shown by many authorities that, taking into consideration all outlay, gold has,

in late years, been produced at a loss. While the mines that pay dividends are exceptional, those that produce gold at a loss are plentiful."

It may be true that the average cost of producing gold exceeds the value of the gold output. The production of gold does not necessarily stop when the cost exceeds its value. Men do not stop speculating in Wall Street because the average speculator loses money. Only 15 or 20 per cent. win, and yet the supply of speculators does not diminish. The opportunities for big winnings attract both speculators and miners.

As, however, the production of gold becomes less and less dependent upon chance finds and more dependent upon the use of "stamp mills," cyanide mills, dredging machines and other gold-extracting apparatus, employed mainly by large corporations and working on inexhaustible supplies, the profits of production will, in future, be more calculable and certain and the amount of gold produced at a net loss will diminish.

The one thing certain is that the output of gold has doubled twice in about 24 years and is continuing to increase rapidly this year. The payment, in London, a few days ago, of \$25,000,000 in dividends on South African mining stocks and the fact that these stocks have, within three weeks, added \$100,000,000 to their former values, does not indicate that gold is

produced at a loss in the world's greatest mines, or that "gold production is apexing." If the output of gold continued to increase at an average rate of about 8% from 1901 to 1907, when times were good and the cost of mining was rising rapidly, will it not be likely to increase even more rapidly this and next year, when times are bad, when labor is cheap and efficient and when prices of commodities are considerably lower than in 1901 and 1907? Is it not the rule that a boom in the mining of gold and silver follows an industrial depression? Is not a decline in prices and wages equivalent to an advance in the price of gold? The profits of production being greater, why should not the output of gold increase rapidly at such times?

WILL GOLD DEPRECIATE AS THE QUANTITY INCREASES?

Space will not permit even the mention here of the various theories held by economic authorities in regard to the "quantity theory of money." We believe, however, that the best thought of the best economists is reaching the conclusion that the cost of producing gold determines, or tends to determine, the exchange value of gold with other commodities, just as the cost of producing other commodities determines their exchange value with each other. This being true, it naturally follows that when

the cost of producing gold, measured by other commodities, is low, both the production of gold and the supply of gold will increase. As the quantity increases the quantities of other products for which it exchanges will gradually decrease. That is, the prices of commodities will rise.

It is not necessary that there should be an exact ratio between the quantity of gold and of other commodities. Thus no one, perhaps, will pretend to say that prices should exactly double every time the quantity of gold doubles, or that a 25% increase in the supply of gold will be followed by a 25% increase in the average of prices. It is probably true, however, that the ratio between gold and other things is more nearly direct than is the exchange value (price) between the changing quantities of other commodities. That is, a 100% increase in the world's supply of gold will more nearly depreciate the value of gold 50% than will a 100% increase in the quantity of wheat, or copper, or peaches, or maple sugar depreciate the price of either, or all, of these commodities by 50%. Doubling the quantity of some commodities would more, and of others less, than halve their prices. Doubling the quantity of gold will, perhaps, after allowing for the growth in the world's supply of goods and for the natural decline in the price of commodities (especially manufactured ones),

be about equivalent to doubling the prices of commodities—that is, to depreciating the purchasing power of gold 50%.

Thus, since 1896, the world's visible supply of gold has increased from \$4,359,600,000 to about \$7,250,000,000, in 1908, or 66%. From 1896 to March, 1907, average prices rose about 60% in this country, and 40% in England. From March, 1907, to June, 1908, prices declined about 15% both in this country and in England. From June to August prices rose about 3% in this country. At present, therefore, average prices are about 45% higher in this country and 25% higher in England than they were ten or twelve years ago.

Assuming that monopolies are largely responsible for the greater advance in prices in this country than in England, it appears that average prices are now about 30% higher than they were in 1896 and 1897. Average prices, then, have risen about 30%, while the quantity of gold has risen 60%. It would appear from these statistics that a yearly increase of about $2\frac{1}{2}\%$ in the world's gold supply is necessary to offset the natural decline in prices, and the increased quantity of goods and that all above this $2\frac{1}{2}\%$ tells directly on prices. This statement is, of course, only an approximation. It may be far from true in the next decade. It is probable that, during the next two years, prices will advance much faster than the gold

supply will increase. Possibly, and even probably, the rise in prices, during the next five years, will fully keep pace with the rise in the quantity of gold.

If then, as now seems probable, the world's visible supply of gold increases 25% by 1913, it is more than likely that the price level will then be fully 25% higher than it now is. By 1918 we may confidently expect to see prices 50% higher than they now are.

EFFECTS UPON INTEREST RATES AND SECURITY VALUES.

The preceding brief discussion of gold output and depreciation is necessary because it is fundamental.

If the gold supply is not to continue to increase or if an increase in the world's gold supply does not mean higher prices for commodities, then there is no need to waste time discussing the effects of the gold supply upon security values.

It is reasonably certain, however, that our gold supply will continue to increase rapidly and that prices of commodities will continue the rapid rise of the last eleven years, broken only in 1903 and 1907.

One of the most certain results of depreciating gold and rising prices is rising or high interest rates. This anomalous fact is not understood by many investors and speculators,

nearly all of whom naturally suppose that more money means cheaper money—that is, lower interest rates. The explanation is not difficult.

When prices are rising rapidly, from year to year, there is a great demand for money to invest in property which is appreciating in value and in the production of the things that the people are willing to buy at higher and higher prices. Nearly everybody wants to speculate in commodities and opportunities to production. Those who are without capital are willing to pay high rates of interest to obtain it.

When prices are rising, the owners of property that is increasing in value are getting richer and feeling richer; hence they are spending freely. Because prices are rising, merchants are buying more goods, farmers more land and real estate speculators more lots and houses than they need. Everybody is trying to get ahead of everybody else. The monopoly and forestalling game goes on at accelerating speed, until something happens to cause a halt. Then, suddenly, everybody wants to sell and get out. Prices tumble, possibly a panic occurs and then follow one, two or three years of depression and recuperation.

Human nature, remaining unchanged, rapidly rising prices will always mean extravagance, recklessness, over-speculation, inflation,

collapse, remorse. Periods of great industrial activity and of stagnation and depression will follow each other in rapid succession. The masses of the people will become discontented and rebellious.

Viewed from the standpoint of the lender of capital, we can see another reason why interest rates should be high when money is depreciating in value. If the depreciation is 5% a year the principal of a debt is losing 5% of its purchasing power each year. At such a time a rate of 4% would yield 1% less than nothing to the lender of capital. It is evident that the rate of money interest should be sufficient not only to make good the shrinkage in the principals of debt, but to return something more to lenders.

This somewhat new theory of money rates is fully discussed in Professor Irving Fisher's recent work on "The Rate of Interest." It is now fully accepted by John B. Clark, J. Pease Norton and other professors and economists. It is the only theory that fits the facts at all times and in all places. It explains why interest rates have been high, during periods of great gold production, and low during periods of low production. It explains why interest rates were, previous to 1896, higher in silver than in gold-using countries.

It is certain that interest rates have averaged very high during the last six or eight years.

It is almost as certain that they will average high (say, from 5 to 7% for time money) during the next five or ten years. The present low rates may last a few months longer, but are reasonably certain to be followed by considerably higher rates within a year if not within six months.

HIGH INTEREST RATES MEAN LOWER PRICES FOR BONDS.

Men with surplus money are always on the lookout to get as big a yield as possible from it. They will not long hold bonds that yield only 4 or 5% when they can loan money outright at $5\frac{1}{2}$ or 6%. Beyond question, the prices of bonds depend mainly upon the rate of interest.

Because interest rates were high and rising, from 1904 to 1907, the prices of bonds declined during this period. Because the rate of interest is temporarily low the prices of bonds are now rising. Both because the rate of interest will soon begin to rise again and because there is a tremendous supply of unsold bonds (many of them carried over from 1906 and 1907), the present rise in the prices of high-grade bonds is likely to be short lived and very disappointing to the many bond dealers who are confidently expecting several years of rising bond prices and prosperity.

Already we see signs of a turn in the prices

of the highest grade bonds. British consols, although they rose only 5 or 6 points from their lowest prices (from about 82 to 87½) are now slowly declining again. They are now about 20 points below their high prices of a few years ago.

It is doubtful if our municipal and state bonds will sell higher, at any time, than they are now selling. A 4% basis will probably be about the minimum for the next few years. Within two years we are likely again to be on a 4½% basis for cities—and a 5 to 6% basis for the best railroad bonds. This means that our municipalities, railroads and other corporations will soon have to pay higher rates for loans. This, in turn, means higher fixed charges and increased expenditures.

RISING PRICES MEAN HIGHER OPERATING COSTS.

Rising prices and high interest rates mean high cost of operation and production on railroads and other public-service corporations, and in mills and mines. By increasing the cost of living they necessitate high wages and thus, again, necessitate increased cost of production. As wages rise more slowly than prices and the cost of living, labor becomes dissatisfied, inefficient and often turbulent, during periods of rising prices. This fact increases the burdens and troubles of corporation officials and other producers and employers.

Some industries are free to recoup losses from increasing cost of operation; others are not. In the fortunate class are most manufacturers, merchants and professional men. If, in addition, they own mines, forests, land and buildings, they are doubly fortunate, for these will rise in nominal value as gold depreciates. If, besides, these owners of productive forces have their properties mortgaged at low rates of interest, they are trebly fortunate. Their debts will depreciate as the purchasing power of gold declines.

Railroads cannot, as a rule, increase rates except with the consent of commissions or legislative bodies. This practically means that they cannot recoup their losses from increasing cost of operation, until their situation becomes desperate. They suffered much from this disability in 1906 and 1907. They are likely to suffer far more in the next five years. The effects will be felt most by the great trunk line roads with their expensive terminals and heavy capitalization. They will be felt least by the roads in undeveloped territory. Roads that own mines or large tracts of land will benefit materially by their appreciation.

Street railways will fare even worse than will the steam roads by gold depreciation. Relatively, the street railways expend more for labor than do the steam roads. They are, therefore, hit much harder by rising wages

than are the steam roads. Besides, the opportunities for economies are not so great as with the steam roads. The difficulties of raising fares are also even more difficult than in the case of steam roads. The future for the stocks of most street railways, and especially for the over-capitalized ones, is not bright. They may hold up well for a year or two longer. After that, the slow but sure process of increasing cost of operation is likely to tell adversely on the value of their stocks.

The stocks of other public-service corporations—gas, water, electric light, telephone, etc., companies—will behave much as will those of street railways. The prices of the products or services of all of these corporations are fixed by law or custom. They can be raised only with great difficulty. Unless invention and cheaper cost of service can keep pace with gold depreciation the net earnings of these corporations will diminish towards, if not to, the vanishing point.

The growth of some cities will, of course, be sufficient, for several years, to overcome the increasing cost of operation. As a rule, however, the stocks of public-service corporations may be expected to decline from year to year.

I will not attempt to discuss here the effects of gold depreciation upon debtors and creditors and upon the distribution of wealth. Generally speaking, debtors are benefited, and creditors

injured, by a depreciating standard of value. Wealth is distributed quite differently from what it would be under a stable standard of value. This different and unjust distribution causes great dissatisfaction and unrest, which shows itself in politics, religion and industry. The indirect effects of this discontent upon security values is likely to be very great in the next five years.

***Increasing Gold Supply and Stock Prices.**

By MAURICE L. MUHLEMAN, ex-Deputy Assistant Treasurer of the United States.

The enormous increase in the world's production of gold and its influence upon economic conditions, particularly with reference to the future of investments and speculation have been quite extensively discussed in recent years. It may seem to those who have followed the discussion that the subject has been fully covered; but the factor of reserves, to which I merely referred in my paper included in the "gold symposium" conducted by the editor of Moody's Magazine in December, 1905, has not, in my opinion, received adequate attention.

The function performed by the yellow metal, of furnishing a medium of exchange, important as this is, must be regarded of far less potency in economic influence than the function of serving as a reserve basis for credits, which has almost universally de-

¹This article was specially prepared for the market letter service.

volved upon it exclusively. A review of the data bearing upon this point may prove useful in determining the probable course of events. As introductory thereto, the statistics of production and distribution of gold should be presented.

It will be recalled that during the decade from 1878 to 1887 the average annual product was about 105 millions; thus the addition to the monetary stock was practically negligible in amount, after making allowances for industrial consumption, losses and hoarding in the Orient (Egypt, India, China, etc.). It was hence natural that a substantial part of the world's population should turn to silver to supply the growing monetary needs. Inadequate reserves tended to retard development.

In the following decade (1888 to 1897) the average production was 161 millions, the greater part of the increase occurring in the latter half of the period. The movement toward silver ceased; a number of nations adopted the gold standard in place of the silver or bimetallic; and they were enabled to acquire the necessary yellow metal owing to the coincident falling off in ordinary demand due to the slow recovery from the general depression following the financial crisis of 1893.

In the decade closing with the last year (1898 to 1907) the average annual output more than doubled, reaching the unprecedented fig-

ure of 325 millions; and this notwithstanding the interruption of production in 1899 to 1901, due to the Boer War, which prevented the disemboweling from the earth of probably 200 millions. It is to the economic developments of this decade that attention should be directed; the depression referred to above reached its end in 1897, the period of low ebb in prices and in enterprise.

The available statistics indicate that of the 3,250 millions of gold produced in the decade, approximately 2,300 millions were made available for monetary purposes; 950 millions were diverted to the arts and into hoards. Of the monetary gold thus added 1,100 millions may be assigned to Europe, 850 millions to the United States, 350 millions to the rest of the world. Estimating the world's monetary stock at the end of 1907 at 7,000 millions, the increase has been nearly 49%. Europe's supply increased nearly 37½%, that of the United States about 112%; the rest of the world gained nearly 46%. Europe and the United States together have over 84% of the total; they have a little less than one-third of the population, but control fully 80% of the import trade of the world.

[Our purpose requires the consideration of the manner in which the added gold was used, to facilitate credit and capital supplies to the renascent enterprise of the civilized world,

emerging from its semi-paralysis after 1897. It was necessarily made available to industrial and commercial development through bank reserves. The absence of correlative demand for money-means prior to 1898 caused the abnormally low discount rates which prevailed for several years in all the financial centers of the world. When the stimulus of the "renaissance" was felt rates rose, reaching a maximum in 1899-1900, when, owing to the check upon South Africa's production, demands had temporarily outrun supplies. Thereafter rates adjusted themselves generally to a higher level.

It is to be noted here that commodity prices advanced and prices of securities having fixed income values declined; indicating a cheapening of money notwithstanding the higher current rates recorded; upon the other hand, securities having an indeterminate income rate rose materially in the markets, in a certain degree speculatively. This was the general trend, although violent fluctuations took place; and some noteworthy aberrations are observed which are referable to the manner in which the reserve gold was employed.

It is essential to have continuously in mind that money-means include bank-credits, the instrumentality by which liquid capital is provided; the supply of actual money, in the common use of the term, except so far as it relates to reserves, is of subordinate importance; de-

posits and credit-notes, and the basis upon which they rest, constitute the factors of paramount influence. Of the 1,100 millions of gold gained by the countries of Europe not more than one-half went into reserves; of the great gain recorded for the United States reserves took about 500 millions. The gold which went into general circulation was obviously deprived of its full efficiency.

It is the degree of efficiency with which gold is utilized that tends to regulate the provision of money-means and their cost; the salient elements in financial operations. We are without accurate or complete data whereby this can be measured; yet as regards Europe and the United States we have sufficient to enable us to approximate. From these it is safe to conclude that the gold reserves in Europe are about twice as large in ratio as are those of the United States, and that the expansion of credits in the decade has been very much less, both actually and relatively. The statistics of note issues in Europe are particularly interesting; the increase in the decade has been 800 millions, with an increase of the gold reserves of 250 millions; the ratio of gold has been maintained at very nearly 50%.

The available data for the United States show an expansion of credits of banks other than savings institutions of over 200%, an increase of gold reserves of only 100%. The

ratio of gold held against our credit currency was in 1907 only 21.8%; less than half the ratio in all Europe.

The operations of the systems of the four leading nations in the financial world will throw further and more satisfactory light upon the events. Widely varying in constitution as they are, the inter-action and inter-dependence are nevertheless marked. Great Britain, because of the vast aggregation of capital, is the chief source of supply; the United States, with almost boundless natural resources and energy stands first in the line of demand. British operations are carried on most largely by checks upon bank credits; in the United States this is so in less degree; Germany and France use coin and bank-notes much more extensively. This importance of the reserve is the same whether it stands against check-money or notes.

France conducts her operations through a central bank under Government supervision; it is essentially a currency bank, its deposits (other than public moneys) being less than one-tenth of its note-issues. Respecting reserves the restriction is that the bank must hold sufficient coin so that it shall not fail to pay its notes and deposits on demand; the remaining assets are chiefly short-time commercial paper re-discounted for other banks; it may use large silver coin in payments (the

bimetallic law prevails), yet in fact its gold holdings are considerably more than 50% of its demand liabilities. In the past decade the gold increased to 160 millions, note-issues less than 200 millions. The margin of expansion is consequently very considerable.

Other French banks carry much larger deposits than the central bank, but with relatively small reserves, and part of these are held in the great bank; the ratio of "cash in hand and in the bank" is probably not in excess of 10%; but with the right to rediscount paper immediately the other banks have the means to restore reserves quickly from the central bank's stock. The mechanism has operated so that the discount rate in Paris was for a period of nearly seven years from 1900 maintained without change at 3%, an inestimable boon to all interests. Such expansion as was necessary having been accompanied by a corresponding growth of gold, the conditions remained stable, until our panic caused disturbance; yet this brought about a rise in discount rates to only 4%.

Germany has also a Government-supervised central bank, chiefly a currency bank; yet its deposits are relatively larger than in the case of the French bank. It may issue additional notes to meet demands subject to a 5% tax, without reference to its reserves. The gold ratio is hence usually lower than in France,

30 to 35% being the recent average. Here also the other banks, with very extensive deposit accounts, carry much of their reserve in the central institution, having cash on hand only 5 to 6%. The margin of expansion except subject to the tax is narrow; hence discount rates fluctuate very considerably, the record for the period of absolute stability in France referred to, showing a range from 3 to 7%, with 21 changes; the panic pressure of 1907, causing a net loss of 28 millions of gold, brought the rate to $7\frac{1}{2}\%$.

The German mechanism in theory provides for automatic expansions and contractions of notes and credits by means of the tax; this doubtless serves to restrain inordinate speculation. Yet it does not obviate a fierce struggle to maintain gold reserves which manifestly operates to tax all business interests. However satisfactory the system may have worked in aiding the development of the Empire, there are evident defects: the supply of gold in actual circulation is much larger than need be, and the strain upon reserves causes undesirable instability.

In England a privately-controlled central bank regulates a system in which numerous powerful institutions are dominant factors. The note-issues, covered partly by coin and partly by bonds, are not large; deposits of the central bank, while ordinarily less than twice

the note-issues in amount, are only a fraction of those of the other banks. Yet the latter hold relatively small cash reserves, probably 5%, depending upon the great bank therefor; the bulk of its deposits consists of these reserves; it endeavors to maintain a 40% ratio against these liabilities, but the margin is frequently narrow. Hence discount rates ranged between $2\frac{1}{2}$ and 6% during the seven years from 1900, and reached 7% under the panic pressure of 1907.

Expansion appears in the deposits of the other banks, undeterred by reserve requirements. Thus the liabilities grew in the past decade fully 600 millions for the United Kingdom, yet the entire stock of gold increased only 100 millions, and not all of this accrued to reserves. A struggle for gold manifests itself first in the British center; the mechanism enables its bank to shift demands upon other points, but this is done at largely increased charges for money, taxed upon business.

The effect of the panic upon the three great banks is treated in great detail, showing the changes week by week, in pages 189-197 of my work "Monetary and Banking Systems," just published.

In the United States the monetary affairs are conducted by about 20,000 individual banks under indifferently effective govern-



mental supervision; they create credits under very lax reserve restrictions, excepting only the few national banks in central reserve cities (New York, Chicago and St. Louis). Those in the chief center undertake regulation in a measure, but the results are not satisfactory. The great mass of the institutions are inadequately provided with cash reserves, because of the permitted inordinate expansion of credits. The greater part of the nominal reserves is loaned to banks in the centers; much of the cash reserve consists of Government and bank notes; hence the credits are in a large measure supported by credits, instead of by gold. Even this conglomerate cash reserve declined in relation to deposit liabilities from 18.8% to 11.3% in the past decade.

Credit
=
Instab

Conditions of demand require the provision of greater supplies of cash as well as credit means, in the latter half of each year; but the practice causes the major part of each year's added supply to continue in use; the excess is concentrated in the center, causing congestion there during the period of slackened demand; when the needs recur the imperative recall of the funds causes stringency; sometimes creating panic. We have thus a record of instability of money-rates not found elsewhere in the world, manifested principally in the rates for "call-loans" annually for considerable periods below 2%, and at other periods rising frequent-

ing reserves

ly to 100% and more; ordinary loans show fluctuations equally vicious although not so violent; and rates at interior points, while fluctuating less, are at materially higher figures than they should be, because of the artificially created dearth of means there.

The alternating "feast and famine" in the supply of money means as indicated by the rates are obviously due to the almost unrestrained expansion attributable partly to the wretched currency system, partly to the irrational reserve requirements. The excessive means existing in the first half of each year are employable only in the speculative field; the absurdly low rates incite inordinate speculation; the violent fluctuations in money rates cause violent fluctuations in the security markets; inflation of prices, reactions, periodical crises, scrambles for gold; these conditions are not only pernicious to the security markets, but detrimental to all interests. It is clear that approximately stable money rates are imperatively needed; that changes in our currency and reserve laws would bring this about.

France alone of the four great nations shows a rational observance of the principles of reserves; and there alone money rates are fairly stable; in the United States conditions are by far the worst, the credit-structure being comparable to an inverted pyramid, that topples with very little pushing. Obviously there has

been for some time past and is now a need for a broadening of the yellow metal base for credits; most countries of the world require it unless a violent contraction of credits and a suspension of development are to take place. Had the world's banking institutions operated under adequate reserve regulations, the increased output of gold would have caused far less disturbance.

There are indications that the question is about to receive serious attention; corrective measures are under discussion here, in London, and in Berlin; if carried out these will naturally bring about an added demand for gold that will absorb the growing supply for some time to come. This will tend to neutralize, at least in part, the tendency to decline in its purchasing power; but a far greater benefit will accrue to the world through the greater stability in money rates that more rational gold reserves will bring about. Not only will ordinary business interests reap a distinct advantage, but security markets will be influenced in a much greater degree by value, actual or prospective. Much of the detrimental character of speculation will be eliminated.

NOTE.—In order to make Mr. Muhleman's article thoroughly comprehensive, his former article referred to in the first paragraph above is reproduced, by permission, and appears on the next page. T. G.

Gold Supply Not Too Great.

**Reserve Demands Will or Should Absorb It—
\$3,500,000,000 of "Uncovered Paper Money"
Should Be Protected—Bank De-
posits Inadequately Secured.**

By MAURICE L. MUHLEMAN.*

Before proceeding to the consideration of the question of the influence of the rapidly increasing gold supply, it is proper to say that the table submitted, presenting the volume of monetary gold for the purpose of comparison with the fluctuation of prices, wages and interest rates, is unsatisfactory for the reason that it limits the statement of the supply of money to gold, whereas silver, certainly for the period prior to 1873, and in a diminishing degree only since that date, was endowed with full money functions; hence if the volume of money is an important factor, the deductions from the table will in all probability be erroneous. The same may be said respecting the omission to include paper representatives of money, the use of

* Reproduced (by permission) from Moody's Magazine for December, 1905, and used as a supplement to Thomas Gibson's Special Letter of June 18, 1908, in which Mr. Muhleman discusses the effect of the increasing gold supply upon stock prices.

which unquestionably potentially influences the conditions that cause price fluctuations. Moreover the volume of gold of the entire world, is compared with prices, wages and interest rates for the United States alone; it is not only conceivable, but demonstrable, that circumstances influencing only the United States, have been potential in causing fluctuations there, in very large measure irrespective of the supply of gold in the rest of the world.

Coming now to the specific topic for discussion, it is obvious that, as gold has been made the chief, and in the most important states the sole, medium of exchange and measure of values, a very marked change in prices, wages and interest may be looked for within a decade, unless the additional supply is offset by new demands. Other channels for the employment of the surplus of gold have been or will be suggested as likely to avert a radical disturbance in the markets; I confine myself to the one of reserves.

Regarding the adaptation and adjustment of our artificial or conventional methods to the changing natural conditions as a primary obligation of the civilized state, no utilization of the added gold supply to the promotion of the well-being of the race would be more rational than its employment in fortifying the reserves of financial institutions. No one who has given

the subject more than merely superficial consideration will question the assertion that such strengthening is necessary if we would protect the credit structure adequately against the periodic dangers to which it is exposed; dangers which so frequently bring about disasters, the effects of which are felt for a decade, during which a very substantial portion of the race is subjected to misery, inevitably retarding the progress of civilization.

We are informed by statisticians that the volume of "uncovered paper money" is approximately \$3,500,000,000; we know that a considerable number of states are struggling with a depreciated paper standard. Moreover, it is well known that in estimating the uncovered paper volume the specie in bank is all used to offset note liabilities, leaving nothing against deposit or other credit liabilities; and a substantial part of the covering specie consists of silver. Here, then, is a broad field for the employment of the increasing gold product, sufficient to absorb the available output for a decade or more, which governments should recognize.

To illustrate concretely: In the United States we should have some 200 millions more of gold in place of our "greenbacks," 150 millions as a reserve against our silver issues; our banks should actually hold their prescribed reserves instead of being permitted to loan

them out in part, which would require a further provision of, say, 200 millions; our trust companies are notoriously deficient in this respect and should be called upon to fortify themselves, which would give room for a further 200 millions. In London the joint stock banks actually carry such insignificant cash reserves against their 2,300 millions of deposits, that there is an almost continuous protest against the dangerous practice: there a very large amount of gold could and should be gathered to assure stability which to-day exists largely only in the imagination, and only fortuitous circumstances avert trouble. At the moment there comes to hand another protest from the London Statist against this disregard of conservative regulations, instancing the present stringency there as a result of the practice.

It is not necessary to furnish a complete catalogue of the illy-fortified financial institutions; those cited above prove the need and this is sufficiently important to merit the persistent attention of the best thought of the day in governmental and financial circles. It may have been excusable in the period of slender gold output to permit reserves to shrink; that excuse is now no longer permissible; and while there are no doubt other channels in which the extraordinary supply of yellow metal can be used, none would so readily pre-

vent inordinate market fluctuations, at the same time tending to avert the disasters following inadequate reserves, which so frequently interfere with the steady progress in our economic evolution.

Review of the World's Gold Supply.

By ARTHUR SELWYN-BROWN, E.M.; M.A.; B.Sc., Consulting Mining Engineer.

Mankind has been interested in gold and gold mining since the dawn of history. Man had scarcely emerged from the Neolithic, or Stone Age, before being attracted to gold. With his remains, found in various parts of Europe in caves and earth mounds, crude gold ornaments are not infrequently discovered. By charting on paper the various sites on which such gold ornaments have been found, and noting the other articles found accompanying them, it is possible to locate the primitive gold-mining centers of Europe, and learn the extent and nature of the barter carried on between the tribes dwelling near the gold area and tribes living at remote places. Thus we learn of the introduction of gold into commercial transactions.

The earliest written accounts of gold are

This article was specially prepared for the market letter service.

in the Vedas of Brahmins of India which were composed about 5000 B. C.

The Egyptians and Phoenicians coined gold, and the Romans learned by experience the economic changes induced by the abundance or scarcity of gold when that metal plays an important part in a national currency. The history of no other metal possesses more human interest than that of gold. Throughout the ages what terrible tragedies have been enacted in the world's remote corners in the exploiting of new gold fields! What ghastly crimes have been committed through the lust for gold! It was the greed for gold that spurred the Spanish Conquistadores to their wonderful deeds in developing Mexico and South America. It was the same incentive that led to the development of California and the West.

✱ When the tremendous influence gold has exerted on society, is still exerting on society, and is destined to exert in even more numerous ways than hitherto, is appreciated, it is not surprising that some thinkers are moved to believe in an early exhaustion of the world's sources of supply. Scarcity of gold scares have been raised at various intervals since the earliest times. They have not been uncommon in recent years, and lately there has been a tendency in some quarters to unduly emphasize the imminent dangers threat-

ened by an overproduction of gold. It is proposed in this article to cursorily review the gold production of the past and present, and to indicate the probable course of production in the near future.

EARLY GOLD SUPPLIES.

The world's gold supplies from the earliest times down to the discovery of America were intimately connected with the cheapness of human life. Gold mining was carried on by slave labor. The value of gold, consequently, varied with the condition of the slave markets. It became abundant when slaves were numerous. The Roman historians tell us of the great wealth in gold of great historical characters; but it should be remembered that the quantity of gold possessed by the peoples of ancient times was insignificant when compared with the stocks of gold in the world to-day. But the value of gold in ancient times was much greater than it is to-day. The high ratio of value to quantity appears to have fluctuated only within comparatively narrow limits down to the beginning of the sixteenth century. It is estimated that the stocks of gold in Europe at the time of the discovery of America did not exceed \$225,000,000. Asia possessed gold valued at \$1,500,000,000 in 1492-1500.

The Spanish Conquistadores flooded Europe

with gold taken from the Peruvians and Aztecs. The world's gold producing industries passed to Anglo-Saxon hands when Spain withdrew from America. Since that time, it may be said that the gold production has increased proportionately to the demand for it; or, in other words, it has increased, comparatively speaking, with the populations of the great commercial nations. The sphere of its usefulness has also been greatly extended.

GOLD PRODUCTION IN RECENT TIMES.

As gold is the standard of value of the principal nations to-day, its abundance or scarcity is of vital importance. The stability of the world's money depends upon the augmentation of the gold supply in proportion to the commercial demand for the metal. A scarcity of gold or too great an abundance would seriously interfere with the welfare of a large part of the human race. Few statistics, consequently, are more valuable and afford more interesting studies than those recording the accumulation, annual production and circulation of gold.

In Table I. the production of gold from the discovery of America to the end of 1907 is given. The first three lines give the aggregate yearly production for periods of 28, 24 and 16 years respectively. For the period 1561-

1800 the value of the gold mined is given for intervals embracing 20 years. From 1801 to 1850 the figures are for 10-year periods. From 1851 to 1880 the annual production is given. These figures were prepared chiefly by Dr. A. Soetbeer. From 1881 to the end of 1907 the figures are taken from the "Mineral Industry."

TABLE I.—PRODUCTION OF GOLD FROM THE DISCOVERY OF AMERICA TO 1850.

Period.	Value.	No. Years.
1493-1520	\$107,836,848	28
1521-1544	114,102,912	24
1545-1560	87,305,536	16
1561-1580	90,835,080	20
1581-1600	96,870,400	20
1601-1620	113,149,960	20
1621-1640	110,227,320	20
1641-1660	116,467,680	20
1661-1680	122,974,600	20
1681-1700	142,961,844	20
1701-1720	167,875,680	20
1721-1740	253,389,080	20
1741-1760	326,831,120	20
1761-1780	275,970,920	20
1781-1800	236,257,840	20
1801-1810	118,048,000	10
1811-1820	75,998,160	10
1821-1830	94,397,940	10
1831-1840	135,722,280	10
1841-1850	363,609,260	10

TABLE II.—GOLD PRODUCTION 1851-1907.

1851	\$67,600,000	1880	\$106,600,000
1852	132,800,000	1881	103,102,000
1853	155,500,000	1882	102,000,000
1854	127,500,000	1883	95,400,000
1855	135,100,000	1884	101,700,000
1856	147,600,000	1885	108,400,000
1857	133,300,000	1886	106,000,000
1858	124,700,000	1887	105,775,000
1859	124,900,000	1888	110,197,000

Table II. (Continued).

1860	.. ..	119,300,000	1889	.. ..	123,489,000
1861	.. ..	113,800,000	1890	.. ..	118,848,700
1862	.. ..	107,800,000	1891	.. ..	130,650,000
1863	.. ..	107,000,000	1892	.. ..	146,292,600
1864	.. ..	111,000,000	1893	.. ..	158,437,551
1865	.. ..	120,000,000	1894	.. ..	182,509,283
1866	.. ..	121,000,000	1895	.. ..	198,995,741
1867	.. ..	104,000,000	1896	.. ..	211,242,081
1868	.. ..	109,700,000	1897	.. ..	237,833,904
1869	.. ..	106,200,000	1898	.. ..	287,327,033
1870	.. ..	106,900,000	1899	.. ..	311,505,947
1871	.. ..	107,000,000	1900	.. ..	258,829,703
1872	.. ..	99,600,000	1901	.. ..	260,877,429
1873	.. ..	96,200,000	1902	.. ..	298,812,493
1874	.. ..	90,800,000	1903	.. ..	329,475,401
1875	.. ..	97,500,000	1904	.. ..	350,088,253
1876	.. ..	103,700,000	1905	.. ..	379,635,413
1877	.. ..	114,000,000	1906	.. ..	405,060,249
1878	.. ..	119,000,000	1907	.. ..	412,622,136
1879	.. ..	109,000,000			

It will be noticed that the average annual production in the period 1493-1520 was a little over \$3,800,000. There was then a steady increase right through to the present time.

In studying the figures it is well to bear in mind that the amount of gold produced in any given period largely depends: (1) On the amount of capital invested in mining; (2) the richness of the developed mines at that period; (3) on the comparative profits derived from gold production. Periods of extraordinary production may be noticed in several parts of of the tables here given. In each case they may be explained by the activity of miners in developing newly found alluvial gold fields or the mining of a great bonanza at one or more of the leading producing centers. The

large expansion between 1601 and 1810 was mainly due to operations in South America and Mexico. The increase shown between 1841 and 1850 was caused by the working of the California placers. About 1889 the results of the development of the Indian, South African and certain Australian and American mining fields commenced to increase the gold production. A progressive increase is thence noticeable right up to the present time.

With the view of indicating the relative importance of the principal gold mining countries in adding to the world's gold supplies Table III. has been compiled.

TABLE III.—GOLD PRODUCTION OF LEADING COUNTRIES IN MODERN TIMES.

United States	1792-1907	\$3,044,426,511
Australasia	1851-1907	2,697,324,556
Russia and Siberia	1814-1907	1,483,725,685
Africa	1887-1907	997,413,738
Colombia	1537-1907	899,710,000
Brazil	1691-1907	726,424,326
Mexico	1521-1907	341,620,350
Canada	1858-1907	257,672,488
Peru	1533-1907	200,041,395
Bolivia	1545-1907	199,658,000
British India	1884-1907	137,004,359
Austro-Hungary	1493-1907	75,226,680
Chile	1545-1907	34,601,000

Total \$11,094,849,088

Table III. gives the gold production of those countries where reliable mining statistics have been kept since 1493. It will be noted that in modern times the United States has produced the greatest quantity of gold. Australasia fol-

lows close with the enormous production since 1851 of \$2,697,324,556 worth of gold.

The importance of Russia as a producer of gold is not generally recognized. It will be seen by Table III. that Russia has produced since 1814 nearly half as much gold as the United States has produced since 1792. The positions of Colombia, Brazil, Peru and Bolivia should arrest attention. Mining is carried on in those countries at present under severe restrictions owing to the dearth of labor and supplies, lack of capital and enterprise. Their past production of gold, however, should, in a measure, indicate their value as future sources of gold when the demand for gold and industrial conditions warrant the thorough exploitation of their gold deposits.

GOLD PRODUCTION TO-DAY.

The gold production of the continents is given in Table IV. for the years 1903-7. It will be noticed that there is a steady total increase each year.

TABLE IV.—THE GOLD PRODUCTION—1903-7.

	1903.	1904.	1905.
North America.	\$105,106,409	\$111,192,642	\$118,176,774
Africa.	68,036,433	86,249,936	113,226,971
Australasia . . .	89,206,739	87,241,662	85,970,779
Europe	29,132,342	29,808,900	27,668,111
Asia.	25,134,755	24,839,368	24,446,336
South America.	11,348,805	9,255,745	10,069,942
Other countries.	1,500,000	1,500,000	76,500
Totals	\$329,465,483	\$350,088,253	\$379,635,413

Table IV. (Continued).		1906.	1907.
North America		\$124,335,082	\$116,682,667
Africa		134,804,114	151,363,624
Australasia		82,358,207	75,849,349
Europe		28,085,462	33,296,415
Asia		23,933,670	23,706,026
South America		10,043,714	10,224,055
Other countries		1,500,000	1,500,000
Totals.		\$405,060,249	\$412,622,136

The production is increasing in North America, Africa and Europe. Decreases are noticeable in the records of the other continents. The increase credited to Europe is due chiefly to the successful treatment of Australian and South American refractory ores and to the recovery of gold from copper, lead, zinc and other metals in the electrolytic establishments in England, France and Germany. It is not due to any increase in mining operations in Europe. Very little gold is mined at present in Europe. The decrease in the gold yield in Australasia is due entirely to economic factors and not in any way to the exhaustion of the gold fields. Notwithstanding the immense amount of gold Australian mines have yielded in the past fifty years, mining in Australia, Tasmania, New Guinea, New Zealand and the surrounding islands may be said to be in its infancy. The gold yields of those countries could be stimulated to almost any degree by the introduction of adequate capital and by skillful mining methods.

The gold production in Asia is due mainly to the operation of the Indian mines. The leading gold mining district in India is at Kolar, in the province of Mysore. The Chinese fields yield about \$7,000,000 worth of gold annually. Korea, Formosa, Japan and the East Indies also contribute to the Asiatic production.

The world's gold output last year amounted to 19,958,764 oz., valued at \$412,556,136. About 78 per cent. of this was contributed by the Transvaal, United States, Australasia and Russia. There was an increase in production in 1907 in two of the great producing countries and a decrease in the other two. The production in the Transvaal advanced from \$119,609,373 in 1906 to \$133,352,381 in 1907; and that of Russia from \$22,469,432 in 1906 to \$26,518,253 last year; gains of 11.5 and 18 per cent., respectively. On the other hand, the output of the United States fell from \$94,373,800 in 1906 to \$89,198,711 in 1907, and that of Australasia from \$82,358,207 in 1906 to \$75,849,348 in 1907; the losses, respectively, being 5.5 and 7.9 per cent.

GOLD MOVEMENTS IN GREAT BRITAIN IN 1907.

Although the industrial consumption of gold is increasing with increasing wealth, the annual output of gold is chiefly coined and used as a basis for new commercial credits. The

world's gold market is in London. It will be interesting to study in conjunction with Table IV., giving the gold production in 1907, the fluctuations in the stocks and prices of gold in Great Britain in that year. According to the annual report of Messrs. Pixley & Abell, of London:

"The year 1907 will be memorable for the financial crisis in the United States, which, after threatening for many months, became dangerous during the last two months of the year, and caused great disturbance in the money markets of the world. The bank rate, which stood at 6 per cent. at the beginning of the year, was reduced to 5 per cent. on Jan. 17, to $4\frac{1}{2}$ per cent. on April 11, and to 4 per cent. on April 25. It stood at this level until Aug. 15, when the rate was raised to $4\frac{1}{2}$ per cent. On Oct. 31, on the commencement of the panic in New York, the rate advanced to $5\frac{1}{2}$ per cent., and on the following Monday, Nov. 4, to 6 per cent. A further rise took place on Nov. 7 to 7 per cent., a rate that had not been touched since the year 1870, and at this it remained until the close of the year. The average for the year was 4.927 per cent., as compared with 4.274 per cent. in 1906.

"The arrivals of gold from all quarters amounted to £55,600,000, against £46,000,000 in 1906 and £38,567,000 in 1905; while the total exports were £50,000,000, as compared

with £43,000,000 in 1906 and £30,829,000 in 1905. The imports from South Africa amounted to £29,389,000, against £25,713,000 the previous year, an increase of over 14 per cent.

"The Indian demand for small gold bars was again large, and amounted to £5,700,000. Shipments were especially heavy during the first nine months of the year, but the inquiry slackened later on when the trade conditions became unfavorable owing to the great drop in the exchange.

"The price of gold remained at 77s. 9d. until the middle of March, when it was raised to 77s. 10½d. to prevent the arrivals from being taken by New York. When this demand had been arrested the price fell once more, and remained at the minimum until the middle of May, when the inquiry for Paris in repayment of loans made to England at the close of 1906 caused an advance to 77s. 10½d. There were no important demands then until August, when France again became a buyer, and this continued with intervals until October. On Oct. 28 the American demand began, and the price of gold rose to 78s. and from then on there was no reduction of importance until the end of the year, when the rate fell to 77s. 9½d. on the cessation of American purchases.

"The amount of gold bought by the United States in England was about £15,500,000, and in addition they bought supplies from other

countries, so that the total shipments during November and December from this country were nearly £18,000,000. The high bank rate proved most effective in attracting gold to England to fill the vacancy caused by the withdrawals on American account, and in addition to £3,000,000 received from France under similar conditions to those made at the end of 1906, the bank received from Germany nearly £8,000,000, besides large amounts of Scandinavian coin.

"The exports to Argentina were again large, and amounted to just under £7,000,000. Egyptian requirements were also heavy, and, in addition to gold which was shipped from India, also took nearly £4,500,000 from England. Turkey also took £750,000.

"Early in January the India Council added to their holding in London £1,000,000, but released £1,500,000 later in the year against silver purchases. In November and December they released further £2,500,000 in consequence of the falling off in the demand for India Council bills, and the gold reserve in London now stood £3,650,000 at the close of the year."

This account of the movements in gold during a year that will always be prominent in the world's financial history serves to excellently illustrate two factors that are very influential in promoting the search for gold. The reader

will first notice the universality of the demand for a share of the latest gold production. Then he will observe how dependent the world is upon the Anglo-Saxon peoples for their share of the newly mined gold.

There was a great absorption of gold for currency purposes in the early part of 1908. This will be seen by referring to Table VI., which gives the estimated gold production for the first three months of 1908, together with the gold held by bankers, in comparison with the figures for the corresponding period in 1907.

TABLE VI.

	1907.	1908.
Gold production	\$100,683,000	\$104,367,000
Bank holdings U. S. and Europe, Jan. 1	\$3,351,300,000	\$3,567,000,000
Holdings, April 1	3,400,000,000	3,656,500,000
Increase	\$48,700,000	\$89,500,000
Gold not going to banks	\$51,983,000	\$14,867,000

The "Engineering and Mining Journal" in editorially commenting on these figures stated that, "In the first quarter of 1908, 85.8 per cent. of the approximate gold production of the world was added to bank reserves and currency; while 14.2 per cent. was absorbed in the arts or served to increase private stocks. In 1907, the bank gains were only 48.4 per cent. of the gold production, 51.6 per cent. going elsewhere.

If we go a year further back, to 1906, we find the proportion showing in bank reserves to have been only 23.1 per cent., 76.9 per cent. going elsewhere. And yet the first quarters of 1906 and 1907 were periods of extremely active trade, when money was in general demand.

"The general conclusions to be drawn from these statements are that a period of great financial stringency may coincide with one of large gold production; the crisis being the result of other causes than the gold supply. Further, that such a period of stress, with consequent high interest rates, will draw out gold reserves which have been hidden, or at least have not been apparent or directly available. Finally, it is only a repetition of former experience that a time of financial trouble is followed by a period of decided monetary ease. This, however, is not the result of the gold supply, but rather of the general withdrawal of money from active and speculative use."

CAPITAL INVESTED IN MINING.

The gold annually won from the mines necessitates the expenditure of a large amount of capital and labor. The capital invested in gold mining is enormous. But, unfortunately, there are no means at present of adequately estimating it. A good idea, however, regarding the amount of capital employed by British

investors, may be obtained by studying Table V., which gives the number of mining companies registered in the United Kingdom during the 25 years ending 1904, and the amounts of their nominal capital. This table was compiled for the "Mining Journal," July 4, 1908, by Edward Ashmead, F. C. A.

TABLE V.—CAPITAL IN BRITISH MINES.

	Number of Registrations.	Nominal Capital.
1880	157	£11,940,270
1881	217	20,848,450
1882	169	12,560,800
1883	151	14,712,398
1884	148	14,952,207
1885	138	24,448,951
1886	237	29,439,728
1887	269	34,002,041
1888	365	52,663,400
1889	378	41,015,425
1890	236	19,796,546
1891	298	35,187,125
1892	206	19,807,280
1893	210	14,725,427
1894	331	23,296,361
1895	961	107,387,241
1896	857	94,419,194
1897	606	64,457,583
1898	509	55,396,288
1899	559	71,687,366
1900	525	64,025,292
1901	519	46,376,237
1902	417	43,144,460
1903	430	41,376,052
1904	328	26,948,130

Total twenty-five years.	9,221	£984,614,252
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In referring to Table V., Mr. Ashmead states that:

"Prior to 1880 I found from the 'Stock Ex-

change Year Book' that in that year only 97 limited companies, registered in Great Britain for foreign and colonial mining, were recorded there as then in existence. Of these the larger part are now non-existent. The same book also notifies the fact that in 1880 157 British limited mining companies (including coal) were in operation. It will thus be seen that the great stride made in mining enterprise takes its rapid rise in the last twenty-five years—that is, from 1880. Gold mining in the Madras Presidency of India began in 1880; diamond mining (as regards English registered companies) in South Africa, the same year. The Transvaal gold discovery first took a firm hold on public attention in 1888, and about the same time other goldfields opened up their wealth: Queensland in 1886, Rhodesia in 1893, Western Australia in 1894, and Klondyke and Yukon in 1900. A revival took place in the Gold Coast mines also in 1900, and the Egyptian Sudan in 1903 went to work to rediscover and open up ancient abandoned mines. This activity also brought other mining districts abroad into greater prominence. Mines in Europe, and in the United States and Mexico, especially, gained in public interest in England in late years.

"Table V. has taken much time to compile, and should prove useful for permanent reference. It gives the number of mining and mine

exploration companies registered in each year—1880 to 1904—and the total nominal capital of the same.

“This gives an average of 369 companies and £39,384,570 of nominal capital per annum, and one company and more than one hundred thousand pounds for each day embraced in the twenty-five years under review.

“The record year was 1895, when 961 companies registered with over one hundred and seven million capital. The following year (1906) was also a great year for new mining companies; Western Australia and South Africa were both well to the front in these two years.

“The capital, as near as I can dissect it, was registered to be applied as under:

	Companies.	Nominal Capital.
For British home mining, including coal and iron	2,200	£120,737,077
For the British Colonies and Dependencies, including the Transvaal	4,716	558,992,988
For foreign parts, including the United States	2,305	304,884,187
	<hr/>	<hr/>
Total, 25 years	9,221	£984,614,252

“American mining investments during the same period were much more extensive than the British.”

OTHER MEANS FOR PROMOTING THE GOLD YIELD.

The annual investment of new capital in developing new mines and mining districts is,

probably, the most important factor in promoting the production of gold. But there are many other factors. In some districts severe droughts promote mining by: (1) drying up rivers and streams, thus enabling the gold in the sand in their beds to be worked; and (2) by forcing farm and pastoral workers to seek mining work.

In Australasia and other countries the governments offer bounties, and furnish mining appliances, with the view of promoting the development of new mining districts.

But the most important factor influencing gold production, after the investment of new capital in mines, is the improvement in metallurgical processes and mining methods. This may take various forms. The following will be referred to:

Improvement in Old Processes.—The early mines in California and the Western States were chiefly equipped with Mexican arrastras. They were slow in operation and very inefficient in saving gold. To-day gold ores are crushed and amalgamated in batteries of high-speed stamps of great capacity at a cost of about 50c. per ton. Morison high-speed stamps weighing 1,600 lbs. per stamp crush 10 tons of ore per day per stamp at the Meyer and Charlton mine on the Transvaal field.

The efficiency of crushing mills is increased by automatic screening and feeding appliances,

and by following up the amalgamation treatment by chemical or smelting processes. For example, the method of treating the ore from the Ivanhoe Mine, Kalgvorlie, West Australia, is as follows: The ore is coarsely crushed in rock breakers, sized in trommel screens and automatically fed to heavy high-speed stamps. The gold is amalgamated inside the mortar of the battery and on outside copper tables. The sulphides are concentrated after leaving the amalgamating tables, roasted and cyanided. The sand is treated by bromo-cyanide solutions and the slime is treated in filter presses. Most of the large mines on the field possess mills employing similar complicated processes. In such works very little gold is lost, whereas in the early mining plants in the Western States the loss of gold in treatment was often very large.

Improvements in electrolytic processes have enabled large quantities of gold to be extracted from combination with other metals.

Smelting methods have, also, been greatly improved. This enables almost all kinds of copper, zinc, lead, antimony, nickel and other ores containing gold to be profitably worked.

Invention of New Processes.—The invention of new processes, like the cyanide process, reduces the costs of gold production, and opens up new sources of gold.

The cyanide process has enabled a great

number of mines throughout the world, having low-grade ores, to be profitably worked. The invention of tube mills for fine-grinding, and of decantation and filtering machinery for slime treatment, and agitating and aeration appliances, have recently greatly improved the efficiency of the cyanide process and very considerably reduced its cost.

New Mining Methods.—Mining methods are constantly being improved. Such methods as those practiced in the open cuts at the Mount Morgan mine in Queensland greatly reduce mining costs.

The introduction of gold dredges has opened up large areas of gold-bearing land to miners. This method of mining is largely responsible for the increase in gold production in recent years in New Zealand, Siberia, California, Alaska and elsewhere. The average cost of dredging gold in California is 6c. per cubic yard with a machine of 40,000 cubic yards capacity, and 5c. per cubic yard with a dredge of 70,000 cubic yards monthly capacity.

Future Prospects of Gold Mining.—Gold is widely dispersed in nature. It is not only found concentrated in rich veins; but occurs in immense quantities in sand and sandstone deposits throughout the world. Many volcanic rocks also contain gold. In some districts such volcanic rocks are being worked for their gold contents. It is estimated that the known gold

fields are capable of supplying the world's gold demands for several centuries. When they are exhausted, putting aside any reference to the probability of new fields being discovered and developed, improvements in mining and metallurgical processes will enable poorer and poorer gold-bearing formations to be worked. There is no possibility of a gold famine occurring. Indications all point to a continued steady increase in gold production. Deficiencies caused by the working out of rich bonanza deposits on certain fields will be balanced by the finding of similar bonanzas on other fields, or by the operation of low-grade deposits on a large scale by means of improved and cheapened processes. The annual gold yield is now above \$412,000,000. The demand for gold is so keen that there is no probability of the yield being permitted to fall below that amount. We may confidently anticipate progressive yearly increases in production.

Gold Depreciation Means Rising Commodity Prices.

By W. G. NICHOLAS.

In the conduct of their campaign for the education of the freight-paying public to the virtue of an advance in rates the railroad men might make their case stronger if they would more urgently direct and firmly hold attention to a great underlying equity in the proposition, which has down to date been almost entirely ignored. By so doing they might convincingly prove that not only is there present occasion and necessity for the raise, but they would be showing why this is so, why in a reconstruction of the rate schedules upward they are moving in obedience to irresistible forces, and why there are the best of reasons for anticipating a long continuation of the basic causes which are compelling action.

There is nothing in an elucidation of this subject to excite emotional or dramatic thrill, but in it there will be found more than the germ of a great truth which can be studied with profit by every man who has a dollar or expects to get one—studied understandingly

This article was specially prepared for the market letter service.

and its meaning, force and bearing as an ever-present business and market factor grasped with proper appreciation.

We do not need to be told that most things purchasable with money have advanced heavily in price during the last decade. It is of common knowledge why this is the case, yet the philosophy of the subject is rarely adverted to in conversation or discussion. It is sedulously avoided as wearisome or abstruse, yet it is to-day the very core and essence of our business life, and incidentally the weightiest consideration in the making of the stock market. It bears specifically on every pocket-book.

The general rise in prices which has been going on during the past ten or twelve years has kept substantial pace with the increase in the production of gold and the stock of gold money. The enlarged yield of gold is proceeding at about the maximum stage yet reached, approximately \$415,000,000 a year, of which it is estimated that \$60,000,000 to \$75,000,000 goes into manufactures and arts and the remainder into the money supply—at least \$1,000,000 a day or \$3,650,000,000 in another decade.

**APPROXIMATE STOCKS OF MONETARY GOLD IN THE
PRINCIPAL COUNTRIES OF THE WORLD,
DECEMBER 31, 1906.**

Country.	Stock of Gold.
United States	\$1,593,300,000
Austria-Hungary	306,400,000
Belgium	31,100,000

British Empire—	
Australasia	125,000,000
Canada	62,400,000
United Kingdom	486,700,000
India	337,300,000
South Africa	61,400,000
Straits Settlements	600,000
Bulgaria	7,200,000
Cuba	38,200,000
Denmark	22,600,000
Egypt	140,000,000
Finland	5,100,000
France	926,400,000
Germany	1,030,300,000
Greece	5,600,000
Haiti	1,000,000
Italy	215,500,000
Japan	80,100,000
Mexico	40,000,000
Netherlands	45,900,000
Norway	8,300,000
Portugal	8,600,000
Roumania	20,700,000
Russia	939,400,000
Servia	2,200,000
South American States—	
Argentina	102,700,000
Bolivia	400,000
Brazil	21,200,000
Chile	2,000,000
Colombia	100,000
Ecuador	3,700,000
Guiana—	
British	100,000
Dutch	200,000
Paraguay	100,000
Peru	6,800,000
Uruguay	15,500,000
Venezuela	300,000
Spain	90,900,000
Sweden	22,600,000
Switzerland	29,000,000
Turkey	50,000,000
Central American States	2,000,000
Total	\$6,888,900,000

The ranking authorities of Europe and America hold out no hope of important reduction in the output for many years to come, although some of them, notably Mr. George E. Roberts, for many years director of the U. S. Mint, and at present president of the Commercial National Bank of Chicago, is of opinion that we have reached the limit and no great change either way may be expected for perhaps a decade. The world's gold production has increased at an average rate of about \$20,000,000 a year since 1896—from \$202,000,000 in 1896 to \$412,000,000 in 1907—and most recent computations show that the average commodity price is about 50 per cent. higher now than at the earlier date named.

The conclusion is forced on us that the world is in an era of extraordinary gold inflation, or if that phrase jars, employ the softer word expansion. The net result is depreciation in the value of the dollar, of which measure and reflection is found in higher average prices—not necessarily values, but prices. With gold production going on at the present rate and no indications of a let-down, who can judge with certainty when the rise in prices will stop or the buying value of the dollar find bottom? The one certainty we all see and realize is that the tide is still rising. It does not rise noisily or stormily, and the people are not hourly

thrown into convulsions by the spectacle, yet the tide ceaselessly creeps up, up, up. The level of the golden flood ever reaches higher, without rest or wait. The movement is silent, almost stealthy, yet resistless as death. And every new high record in the volume of gold money makes for higher average prices in the markets of the whole civilized world. That has been the visible effect of the gold inflation force for the last ten years, and if there is any change in the tendency or current it is not yet perceptible.

The railroads stand out as practically the only exception to the upward swing of prices due primarily and chiefly to the gold inflation—not railroad stocks, but the only commodity the railroads have to sell, namely, transportation. That single line of merchandise, the sole product of the greatest of American industries, remains practically where it was ten years ago. The railroads have not participated appreciably in the almost universal price uplift. Transportation as a merchantable commodity is sold at about former quotations. It is entitled to its day in court. It is entirely out of harmony with the rest of the situation.

The raw materials the railroads use in the manufacture of the single commodity they deal in are away up in price (30 to 75 per cent.)—labor, iron, steel, ties and all forms of equipment and supplies. The cost of operation is 15

to 30 per cent. more than it was even so recently as five years ago, and a better standard of goods than formerly is demanded and exacted—greater efficiency, safety and convenience.

There might be valid ground for opposing the contention of railroads for the privilege of marking up the price of their goods, even in the face of proved large increase in cost of production, if it could be shown that the move was being attempted to meet a temporary condition. Unfortunately or fortunately (depending on the point of view) the conditions that now confront the railroads, in common with the rest of the world, hold out no such hope or possibility.

With a continually depreciating dollar the inexorable logic of the situation points to a still higher rise in the register of commodity prices, making escape from an advance in freight rates daily and hourly more impossible. The facts, figures and conclusions presented by Vice-President Brown, of the New York Central, in favor of higher rates were unanswerable as far as they went, but failed to wholly satisfy. If he had gone further and dug deeper into first causes he would have made his contention clearer and at the same time would have proved the utter impossibility of a change for the better in the legitimate railroad position.

Logically there is only one course open. For the reasons set forth in the foregoing it

would be grossly unjust to the employees to cut their wages, in the face of advancing prices for the necessities of life—a movement that threatens to stretch out indefinitely, or until the gold mines shut down or become unprofitable.

In Thomas Gibson's Special Market Letter of July 28, Mr. Arthur Selwyn-Brown presents complete tables of the production of gold from the date of discovery of America down to the present time, besides other facts and data of a most interesting character. Such statistics cannot be pulished too often or distributed too diffusely. They should be always before the vision of a business man, as a map. They tell in the most condensed possible form the story of the revolutionizing development in the world's most important industry—a record that commands the intelligent thought of the country.

Statistics presented by Mr. Roberts tell us that stocks of gold in the principal banks of public issue and public treasuries of the world at the close of 1906 showed an increase of \$1,625,487,000 during the eleven years last preceding, or 85 per cent.

During the twelve years ending with 1907 the production of gold closely approximated \$3,730,000,000; \$2,960,000,000 went into the form of money, according to a high authority.

With this astounding record of gold inflation

already accomplished and the promise of still greater future inflation, where, it may be asked in passing, does the chronic bear on the stock market stand? What hope is there for him?

Gold Inflation and Interest Rates.*

By PROFESSOR J. PEASE NORTON, of Yale University.

Important Problems of the Monetary Commission.

The present commission is facing the problems of inflation, a condition of affairs which are the reverse of 1894. We are in the era of a world inflation. How extensive had been this inflation, by discovery of new processes of mining gold, and new sources of supply, and, more important yet, by new inventions in credit in the way of economizing the use of gold, the first two, at least, Mr. Arthur Selwyn-Brown has exhaustively pointed out.

The whole subject of gold inflation has been a source of much controversy, largely arising from misconceptions. Some writers have maintained that increased supplies of gold cause interest to rise. This is the long-time view and applies to averages of interest covering three and five-year periods. Bankers know that

* An extract from a market letter containing an article on the "Outlook for the Next Six Months," specially written by Prof. Norton for Thomas Gibson.

increased gold reserves automatically reduce interest. This is the short-time view and applies to periods of two months to a year. The chain of events consists of: increased production of gold, low interest as a result of large reserves, general speculation resulting from optimistic calculation of profits on the basis of too low a cost for borrowed capital, pyramiding, rising prices from this speculative demand, higher wages arising from higher cost of living, higher interest because the demand for capital for productive purposes outruns the supply, permanent depreciation of gold, permanent increase in prices, excessive interest, producing a collapse of the credit machinery, temporary stagnation of business. This is the constantly recurring cycle. The money then collects in banks temporarily, and excessively low interest results, as at present.

The interest rate during periods of gold depreciation fluctuates more violently and over a wider range. Commodity prices rose 70% to the beginning of the crisis. Since this high point they have declined 15 to 20%. The low interest, the large supplies of gold, returning optimism, the elimination of political uncertainties, all should result in a violent increase in commodity prices, in railroad rates, in railroad earnings, and long advance in the prices of railroad stocks. The people will do well to purchase the common stocks of honestly man-

aged industrials and railroad corporations. Great profits are ahead, and an era of great activity. As stocks rise in price, bonds will fall still further. In the 1904 depression, New York $3\frac{1}{2}\%$ bonds sold at 104. In 1908 New York City $3\frac{1}{2}$'s are less than 90, a decline of 14 points. If the gold depreciation theory is correct, we may expect to see the prices of stocks very much higher. The more heavily bonded they are, the higher they will go; and bonds will go very much lower.

STOCKS VS. BONDS.

If in a renewal of activity, interest shall harden to 6% and 7% for long periods after a period of speculation of eighteen months, dating from the present time, the event could hardly fail to depress the price of substantial bonds, like New York City issues, ten to fifteen points, and specialties to a considerably greater extent. The reasoning underlying the probability is drawn not only from the effects of gold depreciation which in the long run steadily depresses the prices of bonds which have no equities, but also from technical causes.

The supply of bonds is very large at present. Banks hold considerable quantities bought at higher prices. Substantial advances in price will be met by heavy sales; there is an enormous amount of bonds carried over the crisis by syndicates. These bonds were underwritten

at prices which show at present heavy losses to the members. These bonds, when offered, will carry high actual yields and will, therefore, tend to compete with issues now held by banks and investors, since these latter issues have no more adequate security.

To increase the market for these securities, doubtless, earnest efforts will be made in the way of effecting legislation so that these bonds may become security for public deposits and bank circulation. This temporary solution for the bond market will help to carry on at a more rapid rate the great inflation.

It will mean in the end a redundant currency, higher interest, higher prices for commodities, higher prices for stocks, and ultimately, another collapse in credit, more destructive than that of 1908. But as long as interest stays low, we may expect the glad effects of the merry pyramid of inflation, which the markets build so enthusiastically, and await with foresight the toppling of the pyramid, the collapse of the inflation, the Presidential campaign of 1912, and perhaps the crisis of 1913-14, which has been already foretold by the chronic chronologists, as twenty years after the great panic of 1893, forty years after the dark days of 1873.

REVIVAL OF PROSPERITY AT HAND.

But now, the indications are that the revival of business is on in earnest, and that prosperity

will soon be evident. To this date general statistics are negative. But technical information is quite encouraging. The recovery is due to fundamental causes, economic in their nature, great crops, a wonderful growing country, an inventive people, a sound technical position in the industries and in the corporations, and, lastly, the realization by a few wealthy people of the important effects of gold depreciation. That earnest attention has been paid to the subject by certain important banking interests, and that this probability has figured in plans framed for many months ahead, are facts which are doubtless within the knowledge of a few. In this connection, the true meaning of Mr. Arthur Selwyn-Brown's words regarding the gold production of the future should be emphasized again at least by repetition. "There is no possibility of a gold famine occurring. We may confidently anticipate progressive yearly increases in production." In other words, the inflation must proceed at an increasing rate.

THE IMMEDIATE OUTLOOK.

The stock market has passed through the panic more or less successfully. Few receiverships have occurred. The damage has not been excessive. The recovery to date has been very rapid. For the 1907 disturbance was a credit crisis, arising from inflation, and not an indus-

trial crisis arising from war or waste or great shortage in the crops.

The immediate question is whether the rise in prices has sufficiently discounted the future conditions which we have reason to believe will develop of a favorable nature within the next six or eight months. This would appear quite improbable. Much of the advance is a recoil from two extreme declines, declines which were beyond reason, when measured against existing conditions. It is doubtful whether the elimination of political uncertainty, the recovery in earnings which will be evident during the next six months, the easy monetary conditions, the growing crops, the return of optimism, the effects of gold depreciation, and the rate of growth of our nation, partially checked, have yet been adequately discounted. The public is very timid. The stock market is still among the foothills, and far from the peaks. As long as the public hesitates, the days of large reactions is comparatively insignificant.

The Gold Supply

It may be stated without hesitation that the effect of the increasing supply of gold upon prices of all bonds, shares, or commodities which may be classed as speculative, is more decided and certain in its operation than any other single factor. The process of readjustment due to this cause would be slow and regular if the principles at issue were universally and clearly understood. Not being generally recognized, however, the changes wrought by what is naturally an insidious factor are, at times, spasmodic and feverish. It is a remarkable fact that whenever a revolution occurs in any economic or financial process which is, by its nature, concealed or recondite, its existence and influence are discovered by a number of students simultaneously but independently. Important reversions or modifications may be submerged for a long period, and suddenly light is offered from all parts of the thinking world. It is probable that this intellectual phenomenon extends to, or is

Reprinted from "The Cycles of Speculation," by Thomas Gibson.

communicated to the financial world, and that marked and drastic changes in the affected quarters represent a belated recognition of forces hitherto unknown, and the readjustment of affairs by those who see first and furthest. That the operations of this minority will be important goes without saying. The faculty to grasp fully and quickly anything salient bearing on financial affairs is the ground-work of riches and consequently the trained minds of great holders of shares or commodities will respond most readily to sound basic arguments, and the greatest holders can often make of their knowledge a two-edged sword. For example, certain large holders of bonds, recognizing the fact that increasing gold production means higher interest rates, and consequently lower prices for bonds, would be able to dispose of bonds to advantage because of the apparent general prosperity growing out of this same production of gold. It may be assumed that in pointing out in interviews, etc., this reign of prosperity, the gentlemen in question would modestly omit to mention that the same influences which were causing high prices and much business in some quarters, were working damage in others.

Something of this kind has been going on in our bond and stock markets of late. The inevitable influence of gold on prices has made

itself slowly felt for a long period, but it is only in the last year that a considerable number of individuals whose operations are of importance in the financial world have come to recognize how powerful this influence is. Price changes in divers securities and commodities hitherto unaccounted for, or attributed to wrong influences, have suddenly been explained to a number of important financiers, and a correct understanding of the problem has undoubtedly resulted in radical readjustments in some quarters. With that pertinacity in error which seems to distinguish the ordinary speculator, he has, however, gone on attributing these processes of equilibration to causes which have only a limited bearing on the case. The recent heavy decline in bonds and stocks, for example, was popularly ascribed to political and legislative action against railroads. Scarcity of money was given second place in these deductions, and gold production third place, or no place at all. If we reverse this order of importance and give gold production first place, monetary affairs second place, and political affairs third place, we are nearer the truth. It looks a little ridiculous that the scope of intelligent perspective should be blocked by three thousand miles of water, and that the unthinking majority who ascribe our decline in bonds to local politics should have failed to

recognize so potent a fact as that the decline was world-wide; but such is the case. The readjustment in bonds was due to excessive over-production of gold, and it may be safely assumed that so long as this over-production continues to increase rapidly, bonds will continue low in price or, what amounts to the same thing, interest rates will remain high.

As to the importance of a correct understanding on this subject of gold supply and its influence on prices, I quote from Mr. Byron W. Holt's book "The Gold Supply and Prosperity," which, I may add, is used as the text book for this chapter. Mr. Holt says:

"This is the great problem that now confronts the financial world and demands solution of every investor. Not to solve it may mean great loss and possible failure. To solve it means success and greatly enhanced wealth for all who now have either a fair share of this world's goods or who have credit and can intelligently go in debt for a large amount."

As speculation or investment-speculation, as defined in the introduction to this book, are the subjects under discussion it is the intention to take up, in turn, such points as bear particularly upon price changes of speculative shares and commodities influenced by our increasing supply of gold. The main points to be considered are as follows:

- 1—The effect upon bonds and preferred stocks having a fixed rate of income.

2—The effect upon common stocks of railroad corporations.

3—The effect upon stocks of industrial corporations.

4—The effect upon speculative commodities—wheat, corn, oats, cotton, etc.

For the purpose of argument it will be assumed in this discussion that our supply of gold is rapidly increasing. We know that such has been the case in recent years, and it is the opinion of most students that this increase may be confidently expected to continue. To quote again from the work already mentioned:

"Both the output and supply of gold are likely to increase for many years.

"While the future output of gold is, of necessity, unknown and uncertain, there is great unanimity of opinion, among mining experts, on this point. It appears to be generally recognized that, during the last twenty years, the industry of gold mining, or rather of gold production, has been established on a very different and much more certain basis than any previously existing. No longer is the output of gold dependent mainly, or even largely, upon placer mining and the chance finds of 'free' gold. The supply of gold, in rock, sand, clay, and water, being inexhaustible, it is now possible, by machinery and metallurgical processes, to extract gold, in paying quantities, from many forms of these vast storehouses. To such an extent is this true that the future supply of gold is even more secure than is that of coal, iron, lumber, wheat or cotton.

"Even if prospecting were to stop and attention

were to be devoted only to the gold mines and bodies already discovered, and geologically in sight, it is probable that the output of gold would continue to increase for many years. As Mr. Selwyn-Brown, a gold mining expert, tells us in his very interesting article, 'as the rich surface deposits are being worked out, improvements in mining and metallurgical processes are enabling poorer and poorer deposits to be worked.' That is, improvements in 'stamp mills,' cyanide mills, dredging machines and other gold extracting apparatus and processes are being made so rapidly that it is, every year, becoming profitable to work lower and lower grades of ore, sand and earth. As the grade declines the quantity in sight increases rapidly. In fact there are almost literally mountains of low grade gold ore that can even now be worked profitably. Some of the largest, most productive and most profitable mines of today contain ore averaging less than \$3 and, in some instances, only \$2 of gold per ton.

"The supply of such ore being inexhaustible the output depends upon the number and size of the mills employed to extract the gold. It is reasonably certain that, for years to come, the improvements in methods and processes of mining will more than keep pace with both the decline in the quality of the ore and the increase in the cost of mining due to rising prices and wages, occasioned by the depreciation of gold.

"In view of all the facts, Mr. Selwyn-Brown's conclusion that 'a progressive increase each year may confidently be expected' is conservative. This conclusion, is almost a certainty. The uncertainty lies in the possibility, if not probability, either of discovering many important new mines in the practically unexplored parts of every continent, or of

making improvements that will radically reduce the cost of extracting gold. In either case the increase in the output of gold might be not simply arithmetically but geometrically progressive."

Admitting that the question of gold production is debatable, it remains for the future to develop any radical change, and it will be necessary for the student to decide this point for himself either by the light of facts as yet not established, or by accepting theories as yet not convincingly erected. If a change occurs, or may reasonably be expected, an understanding of the subject from the positive side of the question loses none of its value. The principles involved could be as successfully applied in reading the probable future by modifying or reversing effects, and reconciling them to a modification or reversal in the cause. If, for example, we accept the theory that increased gold production means advancing commodity prices, and find reason later to believe that gold production will cease to maintain its ratio of increase, we may alter our views accordingly so far as this single influence is concerned.

1—The effect of the increasing gold production on bonds and preferred stocks having a fixed rate of income.

In this division of the question the crux of the whole matter is interest on money. The question might, in fact, be stated thus: "What



is the effect of increasing gold supply on money interest rates?" and having solved that problem, the original inquiry is answered.

To reach a reasonable solution we must first examine the effect of an unduly increasing supply of gold on commodity prices. Over-production in any quarter inevitably leads to lower prices. Gold being a fixed standard cannot decline in figures, but it does so in fact. That is to say, the flexible prices of things which gold will buy rise to fill the gap. Thus, since 1896, prices of commodities have risen 50%. The man who loaned money ten years ago finds its purchasing power impaired 33 1-3%, when it is returned to him today, for the reason that commodity prices having advanced 50% in the interim, his dollar will now buy only 66 2-3% of what it would buy in 1897. This impairment of principal will be covered, in part at least, by interest rates. This effect, if not recognized and arbitrary would adjust itself automatically, regardless of whether or not investors recognize the influence of changing values of gold, for money, finding higher returns in other quarters, would speedily desert the long-term, fixed-interest investment field, and prices of such securities would decline through lack of demand.

On the subject of interest rates Mr. Holt says:

"But there is another reason why interest rates should be high when prices are rising. When money is shrinking in value interest rates should be high to make up, or partly make up, the losses on the principals of loans. To illustrate: Suppose that prices are rising 10% a year. This means that the purchasing power of money is declining about 10% a year. Suppose, then, that \$100 were loaned for one year at 5%. At the end of the year the lender would have \$105; but with this \$105 he could buy only about as much as he could have bought with \$95, at the beginning of the year. In reality, he has received no interest at all but has, instead, paid \$5 to the man for holding his \$100. The man with money to loan cannot afford to do business in this way. He is usually as wise as are his neighbors, and fully as able to protect his own interests and to get all his money is worth, either by buying real property, investing in bonds and stock or by loaning on notes or on call."

In submitting the above contentions it must be fairly stated that there is some diversity of opinion as to the effects of gold on interest rates. A few writers demur to the theory; others hold that the effect is nil, and one or two openly adopt the negative side of the discussion, and state that more money means lower rates of interest. The majority of recent investigators, however, appear to be accepting the theory as given herein, and it may be added that prices of the class of securities considered have borne out the hypothesis faithfully, and that the minority have failed to offer

convincing explanations of this readjustment. It will not do to point to the fact that money has been fully employed in constructive rather than investment fields of late; for while this is true enough, it does not explain why gilt-edged bonds such as British Consols have declined in value, while stocks and shares which did not bear the onus of circumscribed returns have advanced. There are, of course, contributory causes: the Labor-Socialistic Government in England no doubt affects the prices of consols, but this influence is specific, and loses most of its force when we consider that not only these particular securities, but practically all others of their class the world over have suffered a radical decline. In other words, interest rates have grown comprehensively higher. The theory appears sound, is borne out by events, and mere denial does not weaken it. It may well be accepted until its opponents succeed in giving us something more convincing in its place.

In support of the theory, Mr. Holt reproduces the following table of British bonds from Moody's Magazine for October, 1906.

PRICES OF BRITISH INVESTMENT BONDS.

	%	1906	1905	1904	1896
British Consols...	2½	86½	89½	88½	*113½
Met. Consols.....	3½	102	104	104½	128½
London County...	3	88½	94½	93	128½

	%	1906	1905	1904	1896
Leeds.....	4	108	109	111½	130½
Liverpool.....	3½	107	109	109	144½
Manchester.....	4	123	128½	124½	159
New South Wales.	3½	100½	100	96	112½
Queensland.....	3½	99½	99	96	111½
Canada.....	3	98½	100½	97	107½
Cape.....	3½	97	98	95	120
Lon. & N. Western	3	93	96	95	124½
Midland.....	2½	76	79	78	†124½
Great Western....	4	123	127	123½	164
Average.....	3.3	100.2	101.8	100.9	128.4

* Then 2¼ %. † Then 3 %.

"Thus," comments the writer, "these 13 British bonds, supposedly the safest and least speculative of all securities, have declined an average of over 28 points in ten years. Considering incomes and present prices, the unfortunate investors in these bonds have not only received less than 1% on their investments, during the last ten years, but, should they sell their bonds, they would find that the proceeds have lost 30% of the purchasing power of a similar amount ten years ago. Altogether, they have suffered a net loss, over incomes, of more than 20%, or over 2% a year."

There are other economic influences affecting interest rates through gold supply, but the one given appears to the writer the most direct and forcible when applied to readjustment of prices to income.

In weighing the influence of increasing gold production and its effect upon interest rates through the advancing prices of commodities, the student is liable to fall into one grave error.

He may perhaps jump to the conclusion that gradually advancing prices of commodities mean gradually advancing rates of interest. This is not at all the case. A sustained ratio of advance means sustained high rates of interest—nothing more. In order to make this clear let us go back to the original principle.

Increasing prices for commodities mean an impairment of the purchasing power of money. If the purchasing power of money is impaired 2% per annum through increasing prices of commodities, and the normal rate of interest is 4%, we can cover the deficiency by making the interest rate 6% and leaving it there as long as this ratio of impairment is maintained. In other words the man who loans \$1,000 at 6% loses \$20.00 per annum in the impairment of capital and receives normal interest of \$40.00 per annum and \$20 extra to cover his loss in capital. Strictly speaking the extra 2% is not interest at all, but an amortization payment. It matters not how high prices ultimately go, he receives each year a bonus sufficient to cover his loss in capital, and the interest rate remains 6%.

Therefore, if prices of commodities advanced for ten years and then ceased to advance, but were maintained at the highest figures reached, interest rates would fall because there would be no further impairment of capital, and what

was formerly amortization, would become usury. On the other hand, if a new ratio of increase should occur in commodity prices and they should advance 4% per annum, interest rates would, if fully adjusted, reach 8%—4% for normal interest, and 4% for impairment of capital.

2—The effect upon Common Stocks of Railroad Corporations.

Here the effect of high interest rates is, or in time may be, offset by returns in the form of dividends, undivided profits, improvement of property, or the fact that income is not limited. But there is another trouble, and a serious one, for which the gold supply is responsible.

If the increasing supply of gold is responsible for higher commodity prices it must be at once apparent that the building, equipment and maintenance of railway properties costs more and more as all commodities, including labor, advance in price. This would be all right if the selling commodity, i. e.: transportation, also advanced proportionately in price; but it is so difficult to override popular prejudice and widespread misunderstanding on this point, that we find continued agitation and legislation not only against advancing rates, but with a view to reducing those which already obtain. There must, of course, be a limit to this thing,

and if the cost of production continues to increase, the railroads must be permitted to demand higher prices for transportation. Otherwise a point would finally be reached where every railroad in the country would be forced into bankruptcy. The great danger lies in a belated assimilation of this truth by the masses, and too much demagoguery on the part of politicians who do understand, but, being politicians, prefer to reflect the views of a majority of constituents, rather than to enter a campaign of proselyting. That evils have been fostered and wrongs committed by eminent railroad financiers is certain; but there is considerable confusion of ideas on this head. Over-capitalization, illegal combinations, manipulation of funds for private gain, and the swelling of dividends for stock-jobbing purposes, when the funds so distributed should have gone into improvements or surplus, have all played their part in arousing the wrath and indignation of the great majority, and they are, as a class, prone to jump to the conclusion that any and every railroad corporation is charging unduly high rates for its services, and making exorbitant returns on invested capital. This has, no doubt, been more or less true in the past in certain cases where extremely high rates were made, and the apparent returns on money attenuated by over-capitalization; but

this evil is gradually decreasing, and the real fight is, or should be, against these abuses. The railroads are suffering for the sins of the past, and may suffer still further; but the time is not far distant when, unless conditions change radically, the railroads must be allowed more latitude in the adjustment of rates.

The prevalent opinion, that needed reforms which strike at the root of the evils mentioned above is a bear argument, is another popular fallacy. Such reforms intelligently conceived, and unswervingly carried out, are all in favor of the small shareholder. If laws can be enacted which will prevent individual interests from plundering or misusing the funds of corporations, and which will compel these corporations to issue reports and statements which are not so involved and complex as to be beyond the ordinary comprehension, the small holder or investor will have a better show. But, having cured these evils, no laws can possibly endure which contemplate curtailing fair returns on money, and fair profits through natural enhancement in values.

But, however fair or cheering this view may appear, the fact remains that it will be slow in its acceptance and slower in its operation. We may therefore summarize the situation thus. Increasing production of gold brings about increasing cost of operation, and so long as cost

of operation is advanced with no corresponding advance in selling price of transportation, the ratio of profits will gradually decrease until a vanishing point is reached.

In the last analysis, a probable tardy and reluctant recognition of the true status of the case warrants the belief that for the near future, the railroads have a hard time ahead of them, and that so far as this single important influence is concerned, it is decidedly a bearish factor.

3—The effect upon stocks of industrial corporations.

Here we have a different proposition. Rising prices for commodities do not interfere with the earning power of corporations which produce and sell commodities, the prices of which are not limited by law. In fact these corporations are, in many cases, gainers by this influence which tends to advance prices, not only of what they buy, but of what they sell. It may be added, parenthetically, that railroad companies which own valuable coal lands, etc., find the bad influences already discussed partially offset by the gain from such holdings. The railroad company, however, may be considered as pre-eminently a seller of transportation and has been so regarded herein.

The industrial corporations whose products

are subject to regulation by law, such as gas and electric lighting companies, are subject to practically the same influences as those which operate against the prices of railroad stocks. Their cost of production advances easily and inevitably, and the selling price remains fixed, or advances with difficulty and under protest.

4—The effect on speculative commodities—
Wheat, Corn, Oats, Cotton, etc.

This phase of the subject will be dismissed with a few words. If the contentions already made are accepted, it is apparent that all such commodities will gradually seek a higher level. A brief examination of statistics will show that this readjustment has been going on for years. The gradually ascending pivotal point, or average price, is particularly marked in the cheaper cereals,—corn and oats, and also in cotton. This is probably due to the fact that wages have not advanced as rapidly as have prices of living. It is found that in periods of hard times consumption of cheaper foodstuffs and textile fabrics is increased, while the consumption of higher priced commodities and luxuries are curtailed. The wage-earner, therefore, has been in reality living in a regime of hard times, although this fact is easily submerged by steadier employment, by a fictitious appearance of general prosperity, and the abil-

ity to spend a larger number of dollars, without realizing fully the loss of purchasing power in the dollars.

It would be out of the question to attempt to enter anything like a comprehensive study of the question of gold production and its effects in a single chapter, or even in a single volume; neither is it necessary to the purposes of this work, for the student who desires a comprehensive education in this regard will find ample means and material ready to his hand. From the standpoint of investment and speculation alone, it is submitted that increasing production of gold is, to use the phraseology of the street, bearish on long time bonds and other securities yielding a limited rate of interest or income, temporarily bearish on railroad stocks, bullish on industrial shares, except as noted, and bullish on speculative commodities.

At the risk of indulging in undue reiteration, attention will again be called to the fallacy of considering such subjects as the one of gold production too remote in concrete effects, or too sluggish in operation to be of importance to the speculator. A thorough understanding of cause and effect bears upon the operations of today, in that it anticipates the results of tomorrow. Through knowledge of influences of this character, serious error may be avoided. For example, one of the profound

axioms of the speculative world is that bonds advance first and stocks afterwards. If we understand why bonds have been, and are at present, declining we may be justified in modifying this view and considering the axiom more or less obsolete. He who operates an engine without a clear understanding of its motive power is likely to get into trouble, or perhaps be blown up.

It may be pointed out also, that a too literal acceptance of the suggested effects of this or any other great price influence is highly dangerous. Even while gold production continues to increase rapidly, prices, not only of shares, but of all things, will overleap themselves and will also swing backwards to the other extreme. The cycles are not completed, until both zenith and nadir have been touched. Changes in gold production will not prevent declines in prices; they will, however, interfere with the regularity of the cycles.

This chapter may be fittingly closed with the following list of conclusions reached by Mr. Holt, in the work already mentioned. These conclusions cover all the points herein presented, and others which are of interest and value:

"1—That both the output and supply of gold are likely to increase rapidly for many years.

"2—That, therefore, the value of gold will depreciate as the quantity increases.

"3—That this depreciation will be measured by the rise in the average price level.

"4—That a rising price level, if long continued, is accompanied by rising or high interest rates.

"5—That high interest rates mean lower prices for bonds and all other long-time obligations drawing fixed rates of interest, dividends, or income.

"6—Rising prices increase the cost of materials and of operation and tend to decrease the net profits of all concerns, the prices of whose products or services either cannot be advanced at all, or are not free to advance rapidly.

"7—Rising prices tend to increase the net profits of all concerns that own their own sources of materials and supplies.

"8—Rising prices of commodities tend to cause the prices of all tangible property to rise. This includes lands, mines, forests, buildings and improvements.

"9—Rising prices of commodities and property tend to increase the value of the securities of corporations holding commodities or property.

"10—Rising prices and cost of living necessitate higher money wages, though the rise of wages will follow, at some distance, behind the rise of prices.

"11—As rising prices do not mean increased profits to all concerns, many employers will not concede higher wages without strikes.

"12—Rising prices and wages, therefore, mean dwindling profits and troublous times in many industries, with complete ruin as the final goal.

"13—Because wages will not rise as fast or as much as prices and the cost of living, there will be

dissatisfaction and unrest among wage and salary earners.

"14—Rising prices of commodities and property encourage speculation in commodities, stocks and real estate and discourage honest industry.

"15—Thus, rising prices, by diminishing the incomes of 'safe' investments in 'gilt-edged' bonds and stocks and by increasing the profits of speculators encourage extravagance, recklessness and thriftlessness.

"16—As rising prices decrease the purchasing power of debts, and thus aid debtors at the expense of creditors, they discourage saving and thrift.

"17—Rising prices, then, by promoting speculation and extravagance, increase consumption, especially of luxuries, and, therefore, stimulate production.

"18—Rising prices, then, result in what is real prosperity for many industries; but what is for a nation as a whole, artificial or sham prosperity—the result of marking up prices rather than of increasing production.

"19—With prices, wages, rates and industries always imperfectly adjusted to the ever depreciating value of gold, and with instability and uncertainty throughout the financial world, there cannot but be a great shifting around of values and of titles to property.

"20—As this shifting is to the advantage of the debtors—the rich—and to the disadvantage of the creditors—the great middle class—it results in rapidly concentrating wealth in the hands of a comparatively few.

"21—For all of these reasons a prolonged period of rapidly rising prices is reasonably certain to be-

come a period of unrest, discontent, agitation, strikes, riots, rebellions and wars.

* "22—A rapidly depreciating standard of value then, if long continued, not only produces most important results in the financial, industrial and commercial world, but is likely to result in changes of great consequence in the political, social, and religious world.

"In view of all the facts, results and possible consequences connected with the increasing output and supply of gold, The Wall Street Journal was right when, on December 4, 1906, it said that 'No other economic force is at present in operation in the world of more stupendous power than that of gold production.'"

APPENDIX

APPENDIX.

The foregoing letters were originally published in pamphlet form as a portion of the regular market letter service. After the pamphlet was distributed several students whose views are entitled to respectful consideration excepted to some of the contentions offered. In order to give the dissenters a fair show, letters received from Mr. Charles A. Conant, Mr. A. Selwyn-Brown and Mr. A. E. Cottier are added to the volume. Other letters of objection or modification were received but all the points mentioned are covered by the three authorities mentioned above.

Mr. Byron W. Holt replies to the non-acquiescent writers.

T. G.

The History of Prices*

By ARTHUR SELWYN-BROWN, E.M., M.A., B.Sc., Etc.

Speculation is based upon the science of values. Values, like all scientific problems, can only be reliably determined by "ample and accurate information" regarding the present and past. The future is only interpretable through experience. The values of to-morrow can only be gauged by a study of the values of yesterday and to-day combined with a variable factor joining the psychic factors of the moment of evaluation with the concomitant factors of progressive evolution and socialization. Prices, or values expressed in money, through social evolution appear to progressively increase when viewed over long periods of time. It is proposed in this article to briefly review the history of prices of a series of years with the view of exhibiting the comparatively

* This article was specially prepared for Thomas Gibson's Market Letter Service by Mr. Selwyn-Brown.

gradual evolutionary processes of evaluation of commodities as shown by tables of prices and articles of general consumption and to indicate the ability of the price-making processes to adequately adjust themselves at all times to the needs of progressive civilization.

It is only comparatively recently that economists have recognized the value of systematically investigating the history of prices. Some excellent essays dealing with this subject have been published during the last half century, but a complete history of prices has never been written.

The important position as a foodstuff held by wheat makes it an excellent indicator of the fluctuations of values. Better records, also, have been kept of wheat prices throughout the ages than of any other commodity. In Table I. is shown the variations in wheat prices over a period of 2,500 years. This table gives the average prices of wheat from the year 600 B. C. to 1908. The prices from 1401 to date are those of the London markets.

The figures in Table I., it will be noticed, show that the average price of wheat rose very gradually between the years 600 B. C. and 1500 A. D. During this period the population of the civilized world increased very slowly. The processes of socialization, or the civilizing influences, were not then very active.

TABLE I.

AVERAGE PRICES OF WHEAT FOR 2508 YEARS.

Period.	Price per Ton.
B. C. 600	£1.1.6
300	1.5.0
200	1.6.0
50	1.7.0
A. D. 50—300	1.7.6
301—500	1.8.0
501—800	1.8.6
801—1307	1.9.0
1401—1500	1.8.6
1501—1600	1.16.0
1601—1650	2.4.6
1651—1700	2.18.0
1701—1750	3.12.0
1751—1800	6.0.0
1801—1850	12.0.0
1851—1880	13.5.0
1881—1889	9.5.0
1890—1899	6.9.6
1900—1908	7.0.3

No great price movement took place until the middle of the 16th century. The political unrest in Eastern Europe culminating in the conquest of Constantinople by the Turks instigated political and commercial changes which had far-reaching effects upon the political and financial development of the world.

Before the Turkish conquest of the "Gate to the East," the Oriental trade was controlled exclusively by the Venetians. Their monopoly was, of course, exceedingly profitable, and was envied by the other European nations. When the Turks cut off the trade the princes of Europe all endeavored to discover new routes with the view of restoring it with profit to themselves. Prince Henry of Portugal was one of the most able of the princes of the time and he strenuously advocated the searching for a sea route south of Africa. The results of his efforts were successful. In 1598, Vasco De Gama, one of his assistants, sailed around the Cape of Good Hope and visited the principal towns on the Malabar coast of India.

This success of the Portuguese stimulated the ambitions of the Spaniards, who were promised title by the Bull of Demarcation of Pope Alexander VI., to all the discoveries they might make to the westward of a line drawn north and south through the Atlantic Ocean 100 leagues west of the Azores. This resulted in the discovery of America. The Portuguese and Spaniards not being very skillful in commerce, the carrying and distributing trades in Europe were developed by the Dutch.

The great commercial activities of the 16th and 17th centuries are reflected in the increase in wheat prices. Following the increase in prices and the good times they indicate there

was a considerable increase in the population of the civilized world. The new trades which were established in the new countries that were being opened up by the Portuguese and Spaniards necessitated improved commercial methods and credit facilities. These in turn required corresponding increases in the metallic money reserves which were met by importation from America. In the period between 1500 and 1700 there was a very considerable increase in commodity prices. The successive increments in prices indicated prosperity which in turn was followed by an increased population and the civilization of large numbers of previously uncivilized people. These processes still continue and profoundly influence the demand for goods and their prices.

Demand usually controls supply, and supply is usually adapted to demand. Demand and value are so intimately related that changes in one affect the other. Consequently the history of prices should indicate changes in man's wants as well as of his activities. In early historical times man's wants were few and easily satisfied. Each man usually raised his own food and weaved the materials for his own apparel. To-day, of course, our wants are manifold and require the fullest resources of our complex civilization to attend to them. Contrasts between the prices of articles in general use in early times—say, in Roman times—with those

of similar articles marketed to-day may be usefully employed to indicate our advancement in socialization, or, as it may be broadly termed, civilization.

One of the earliest lists of prices surviving Roman times is that of the Emperor Diocletian, issued in an imperial decree in A. D. 303 and fixing prices of commodities for the whole Roman Empire. Table II. is compiled from that decree.

TABLE II.

DIOCLETIAN'S PRICES FOR ROMAN EMPIRE, A.D. 303.*

Wine.	Per pint.
Falernian	30c.
Ordinary	20c.
Rustic	8c.
Vinegar	6c.
Beer	4c.
Olive Oil	40c.
 Meat.	 Per lb.
Beef	8c.
Mutton	8c.
Lamb	12c.
Pork	12c.
Ham	20c.
Fish	10c.

Game.	Each.
Ducks	60c.
Hens	90c.
Goose	1.50

Clothing.

Socks	6c.
Breeches	30c.
Cloak	60c.
Shoes	2.00

* Expressed in American equivalents.

According to the Dugdale MSS. in the Ashmolean Museum, Oxford, the stock on a farm in Warwickshire, England, was valued and recorded on September 12, 1290. From this record Table III. was compiled.

TABLE III.

FARM PRODUCTS IN WARWICKSHIRE, 1290.

	Each £ s. d.
11 Oxen	9.0.0
3 Riding horses	1.6.8
3 Carts	6.8
2 Tame deer	1.8
2 Boars	3.0
5 Sows	2.6
28 Hogs, not full grown	1.6
18 Weaned pigs . . . . .	.5
15 Sucking pigs . . . . .	.3

TABLE III—Continued

	Each £ s. d.
21 Ducks . . . . .	.1
20 Bacon hogs	3.4
18 Silver Spoons . . . . .	.10

The prices given in this table are representative of those ruling in the country districts in England at that time. Those in London were about 50 per cent. higher. It will be seen on contrasting the prices in Table III. with those in Table II. wherever possible, as, for instance, those of poultry and meat, that little, or no, advance was made during a period of nearly 1,000 years. Table I. shows there was also in that time practically no change in the price of wheat. The world went very slow during that period and there was little, or no, material advancement in human wants. It was essentially a period of contemplation. Men watched the intellectual combats between the Philosophers of the Neo-Platonic schools and the bishops of the church and saw the church victorious. In the history of philosophy this period is very important. It embraces the whole of what is called the Religious Period and a part of the Middle Ages.

Forces were now gathering strength which were to become active in advancing prices several centuries later. While they were being developed, however, men's attention was di-

rected to intellectual and spiritual matters. Pessimism was almost universally prevalent and the worldly desires of the race remaining unchanged, prices ran along in their old grooves as is shown in the table.

The influences of population on prices are suggested when it is recognized that desire determines supply and supply is correlated to value and price. In the process of socialization, suggestion, invention and imitation are the most active factors. An idea flashes into the mind, or is invented. When novel and interesting it is frequently communicated to others and acts on them by suggestion. The action, or desire, stimulated will vary according to the class and number of people who adopt the suggestion. If the desire is for a certain article of commerce, the intensity of the desire, or the number of calls for it, will be a measure of any consequent fluctuation in price. The production and distribution of commodities are controlled by desires, which are themselves responsive to the alternative and successive fits of optimism and pessimism experienced by mankind, and by the other factors of social progress. Just as socialization tends either toward progress or decay, so desires correspondingly advance or decline in rhythmic sequence.

TABLE IV.
POPULATION, 14 B. C.

Italy	6,000,000
Spain	6,000,000
Greece	3,000,000
Gaul	3,400,000
Other countries	4,600,000
Europe	23,000,000
Asia	19,500,000
Africa	11,500,000
World	54,000,000

Malthus, in 1803, was the first to demonstrate the fact that population has at all times tended to outgrow subsistence. When living under perfectly happy and virtuous conditions a community is naturally constrained to increase. While the means of subsistence increases in arithmetical progression, the population tends to increase in geometrical ratio. Self-restraint, emigration, starvation, vice and other degenerative influences are the regulators of population, and they all influence prices.

The writings of Malthus inspired Darwin's biological researches which led him to the discovery of the law of organic reproduction. Expressed in popular terms the law is as follows: There is an innate tendency of all organic life to increase until neighbors press upon the limit of food supply or production causing starvation and the consequent elimination of the weak and less fit members.

TABLE V.

POPULATION OF WORLD, 1480—1908.

	1480.	1580.	1680.
England	3,700,000	4,600,000	5,532,000
France	12,600,000	14,300,000	18,800,000
Prussia	800,000	1,000,000	1,400,000
Russia	2,100,000	4,300,000	12,600,000
Austria	9,500,000	16,500,000	14,000,000
Italy	9,200,000	10,400,000	11,500,000
Spain	8,800,000	8,150,000	9,200,000
United States . . . . .	.....	.....	.....
Australasia . . . . .	.....	.....	.....
India . . . . .	.....	.....	.....
China . . . . .	.....	.....	.....
Japan . . . . .	.....	.....	.....
	1780.	1880.	1908.
England	9,561,000	35,004,000	44,000,000
France	25,100,000	37,400,000	39,000,000
Prussia	5,460,000	45,260,000	61,000,000
Russia	26,800,000	84,440,000	120,000,000
Austria	20,200,000	37,830,000	50,000,000
Italy	12,800,000	28,900,000	34,000,000
Spain	9,960,000	16,290,000	21,000,000
United States	3,500,000	50,155,783	87,000,000
Australasia . . . . .	.....	.....	6,600,000
India . . . . .	.....	.....	300,000,000
China . . . . .	.....	.....	410,000,000
Japan . . . . .	.....	.....	52,000,000

Population statistics constitute not merely biological studies showing the growth of the race, but the continuation and development of social institutions. They also, as was indicated above, measure the degrees of happiness and

prosperity of the people of different periods; because in times of stress and turmoil few marriages are consummated and births are reduced, whereas in times of general well-being the contrary is true. Times when high prices are universal are invariably times of happiness and prosperity.

Comparisons of Tables IV. and V. with Table I. will indicate the influence of population on the prices of wheat, and incidentally will plainly show the course of civilization.

The opening up of both North and South America and Australasia to European emigrants has greatly influenced prices in recent years. The emigrants are engaged in developing some of the richest portions of the earth and are creating a stupendous commerce which will not only greatly advance their own new countries, but which will prove very beneficial to Europe and powerfully influence prices the world over.

An English statistician named Newmarch, when writing for the "Economist," London, devised a unique method of showing the variations in commodity prices. Adopting the average price of each important article sold in London in any year taken as a basis of comparison, in the specific case referred to, the prices of 22 articles sold in London in 1845-1850—the prices in following years were re-

duced, without loading to offset adverse factors that were liable to influence simple averages. The averages in 1845-1850 were taken as 100 and the prices of subsequent years were expressed as percentages of the initial prices. The sum of such percentages in each year forms the index number for that year. As 22 articles were selected the basic index number for all is 2,200. The value of such a method for popularly demonstrating price variations was immediately appreciated and this method, variously modified, is now universally employed by economists and statisticians.

Index numbers have been published at frequent intervals by the "Economist" and Sauerbeck for English prices; Laspeyres, Paasche, Conrad, Kral, Soetbeer and Heinz, for German prices; D'Avenel, Palgrave and Falkner for French prices; Dun's Review, Bradstreet's Review and Falkner for American prices, and by other authorities in other countries. Table VI., compiled from Mr. Sauerbeck's valuable papers on English prices in the proceedings of the Royal Statistical Society, London, gives representative index numbers covering the years 1846-1907. In view of the equalizing effects of the electric telegraphs and cables and modern commercial methods, as well as the great extent of international commerce, Table VI. covering London market

values may be taken as a typical barometer of the world's price variations during the period covered.

In this brief sketch of the history of prices it has only been possible to lightly refer to a few important epochs in such history, notwithstanding that the accompanying tables contain many extraordinary statistics calling for comment. All references to the important influences the inventions of steam, electricity and chemical and manufacturing processes on prices have been suppressed. It is hoped, however, that sufficient has been said to indicate that prices are as variable as human desires and reflect those desires. They are not constrained by any hard and narrow economic law.

Regarding the future, it may be said there is no possibility of a check to the general advancement of prices. The prices of specific articles may vary spasmodically; but mankind is destined to progress more rapidly in the future than in the past, and the hordes of Asia are likely to be soon civilized. Such progress and advancement must in the future, as in the past, become reflected in demand and prices—prices must continue to advance.

In the table on pages 111-114 the first nine columns represent the Sauerbeck Index numbers. The three remaining columns are compiled from London financial statistics.

TABLE VI—Continued

Year.	Vegetable Food (Corn, etc.)	Animal Food (Meat, etc.)	Sugar, Coffee, and Tea.	Total Food.	Minerals.	Textiles.	Sundry Materials.	Total Materials.	Grand Total.	Silver.	Avg. Price of Consols.	Avg. Bank of England Rate.
1895	54	78	62	64	62	52	65	60	62	49.1	106 $\frac{1}{4}$	2
1896	53	78	59	62	63	54	63	60	61	50.5	111	2 $\frac{1}{2}$
1897	60	79	52	65	66	51	62	59	62	45.3	112 $\frac{1}{4}$	2 6-10
1898	67	77	51	68	70	51	63	61	64	44.3	111	3 $\frac{1}{4}$
1899	60	79	53	65	92	58	65	70	68	45.1	107	3 $\frac{1}{4}$
1900	62	85	54	69	108	66	71	80	75	46.4	99 $\frac{1}{2}$	4
1901	62	85	46	67	89	60	71	72	70	44.7	94	3 $\frac{1}{4}$
1902	63	87	41	67	82	61	71	71	69	39.6	94 $\frac{1}{2}$	3 3-10
1903	62	84	44	66	82	66	69	72	69	40.7	90 $\frac{3}{4}$	3 $\frac{1}{4}$
1904	63	83	50	68	81	71	67	72	70	43.4	93 $\frac{1}{4}$	3 3-10
1905	63	87	52	69	87	72	68	75	72	45.7	89 $\frac{3}{4}$	3
1906	62	89	46	69	101	80	74	83	77	50.7	88 $\frac{1}{4}$	4 $\frac{1}{4}$
1907	69	88	48	72	107	77	78	86	88	49.6	84	4 9-10

NOTE.—It would appear from this letter that Mr. Selwyn-Brown does not accept the increasing supply of gold as the all-important factor in advancing commodity prices. Of course, we want to hear both sides of the question, and, in addition to this, the letter is particularly interesting and valuable in that it is one of the first compilations of this kind ever produced.

T. G.

Gold Production and Prices*

By CHARLES A. CONANT,

Ex-Treasurer of Morton Trust Co., author of "A History of Modern Banks of Issue;" "Principles of Money and Banking;" "Wall Street and the Country," etc., etc.

In my opinion the quantity theory is given an altogether disproportionate importance in many discussions in regard to the value of money. It is probable that prices are influenced by great and permanent changes in the quantity of metallic money, but this influence is only one of several and may be entirely counteracted by the others. From a scientific point of view, the subject calls for careful definitions and fine distinctions and it is difficult to deal with it in a satisfactory manner in limited space. While stability of value in the monetary unit is generally treated as an important aim, even this term "stability" is often used in a careless and misleading manner. There may be apparent appreciation in the purchasing power of gold, which arises from improvement in methods of production, permitting a larger quantity of goods to be exchanged for the same amount of gold.

* Specially written for this volume by Mr. Conant.

There may be apparent depreciation in the purchasing power of gold, arising from scarcity of given articles or difficulty in obtaining them. In either case, it is not strictly the value of gold which has changed, but the value of particular commodities. The clarifying of this problem is the subject of an entire book by Professor C. N. Walsh, "The Fundamental Problem in Monetary Science."

It is my opinion that while the quantity of money is one of several influences operating upon the price of commodities, it is often counteracted,—although it may be sometimes accelerated,—by other influences and that these considerations make it impossible to isolate practically the influence of changes in the quantity of money upon prices. It may be possible to construct a theoretical formula which meets the problem, but it is not possible to separate the data in such a way as to justify any dogmatic mathematical conclusions. Moreover, in my opinion, the quantity theory, in the sense of a uniform rise of prices can never be realized at any single moment, no matter how much time is given for adjustment. If the quantity of gold in the market, operating through increased bank reserves, permits wide extensions of credit, and prices are thereby affected, it will be articles which are most sensitive to changes of price which will first feel the influence. These changes will react upon

the prices of other articles, but the entire problem will become one of constant inter-related changes instead of one of a final rise or fall of all prices to a point which will leave them in their old ratios to each other. The proof of this principle I have endeavored to set forth in Book II., Chapter 2, page 160, of my book, "The Principles of Money and Banking."

To sum up the matter in simple language, the quantity of gold undoubtedly is influential, among other things, upon prices, but among these other things is the state of credit, which at least within short intervals moves prices up and down much more violently than they are moved by changes in the quantity of gold and in the long run defeats any definite calculations as to the separate influence of the quantity of gold.

An Answer to the History of Prices*

By ALONZO E. COTTIER.

It may be true that "prices through social evolution progressively increase over long periods of time" as stated by Mr. Selwyn-Brown, but that they do so without reference to fluctuations in the volume of the money metals as implied by him, his pamphlet affords no proof whatever.

It may be claimed for his theory that increased supplies of the precious metals are manifestations of social evolution and consequently if prices are thus increased, then the primary cause is social evolution, and the increased supply with its results on prices is only secondary, an effect rather than a cause.

It is a noteworthy fact, however, that of the three great upward swings in prices that have taken place during the Christian era, two clearly owed their impulse to wars of conquest—rather than to increased production of the precious metals through the arts of civilization.

* Specially written for this volume by Mr. Alonzo E. Cottier.

THREE GREAT PRICE MOVEMENTS.

The first upward swing in prices of which we have authentic record had its inception in the reign of Augustus. By successive conquests Rome had not alone acquired possession of nearly all the mines throughout the world (then yielding the precious metals) but a large proportion of the whole mass of gold and silver which had been produced during the preceding centuries was drawn to Italy.

William Jacob, in his "Inquiry Into the Precious Metals," estimates the stock of gold and silver in Rome on the accession of Augustus at the equivalent of one billion eight hundred million dollars. This was the accumulated treasure of centuries which had been possessed by the sovereigns of peoples conquered by Rome. The amount seems incredible measured by the accumulation of to-day—exceeding as it does the gold possessed by any nation of the modern world. There can be no doubt, however, that at the lowest estimate the Imperial store amounted to the equivalent of hundreds of millions of dollars, and its gradual injection into circulation among the Romans and the people of Italy was the direct cause of the increase of prices that took place in Rome and which raised the price level in the time of Diocletian to a point probably not far from that prevailing in modern times.

The decline of Rome was accompanied by the wasting away of this treasure, and the Barbarian onslaughts on the Roman dominions hastened its dispersal. Mining practically ceased and the gloom of the Middle Ages followed, when prices sunk to the lowest level of the Christian Era. "Between the 9th and the 15th centuries the quantity of the precious metals in existence had fallen to a minimum and prices reached the point that copper, tin and iron contained a value for their bulk adequate to effect the few and tardy exchanges of the dark age" (Francis A. Walker's Money). The Dugdale manuscript cited by Mr. Selwyn-Brown falls within this period.

The second great upward swing in prices followed the acquisition by the Spaniards of the Mexican and Peruvian hoards of precious metals and the development of their mines upon the discovery of America. The effect on European prices is shown in Mr. Selwyn-Brown's Table No. I. Wheat rose 100% and other prices in proportion. In 1887 Mr. Inglis-Palgrave, testifying before the Herschell Commission, estimated the increase in the supply of precious metals from 1492 to 1640 at 600%, although the increase in prices amounted to only 200%.

The third great upward swing followed the discovery of gold in California and Australia. Prices for articles included in Sauerbeck's In-

dex (Mr. Selwyn-Brown's Table No. 6) rose from 74 in 1849 to an average of 105 in 1857, to 111 in 1873, then dropped to an average of 61 in 1896, following the practical elimination of billions of dollars of silver as a standard money and its regulation thenceforth to the level of a mere commodity.

SELWYN-BROWN'S CONTENTIONS NOT WELL BASED.

Mr. Selwyn-Brown's contention that prices in England in A. D. 1290 remained practically the same as in Rome A. D. 303, is not sustained by his tables. He asks us to contrast the prices of poultry and meat in Tables II. and III. and says that little or no advance was made in these during a period of one thousand years. What the tables really show, however, is an astounding decline. For example, Diocletian attempted to arbitrarily reduce the price of pork to twelve cents a pound (the then current price must have been higher), whereas, one thousand years later a sow could have been purchased for sixty-two cents, and ducks for which the decree price in Rome was sixty cents each, could have been bought for only two cents apiece! It should be noted, however, that an exact comparison of the Roman prices with those of the present day is impossible owing to the uncertainty that exists as to the real

value of the Roman coin—the denarius, in which the decree prices were expressed.

Table No. 6 does not sustain Mr. Selwyn-Brown's theory that social evolution produces higher prices when working over long periods of time. From 1846 to 1907 is a fairly long period of time, and measured by commercial activities, inventions, increase in population and complexity of wants, was probably the most progressive period in history, yet at the end of it we find prices at about the same level as at its beginning. An examination of the table shows, however, large fluctuations during the intermediate years, to wit: a rise of 50% from 1849 to 1873 (gold discoveries), followed by a drop of 45% to 1896 (silver demonetization), a recovery to 1907 of nearly 50% (increasing production of gold).

THE LOW PRICES OF 1896.

The period from 1872-73 to 1896 of falling prices was one characterized by a diminishing supply of standard money. While a general realization of the factor of silver demonetization in producing this result has been obscured by political exigencies in the United States and possibly by self interest in England, that it was the controlling influence in producing the low prices up to 1896 will hardly be denied at the present day.

THE PENDULUM THEORY.

Mr. Holt, the compiler of "The Gold Supply and Prosperity," in summing up the arguments of the contributors to that symposium in a final chapter, suggests that prices under the influence of an increasing supply of gold will rise faster than the actual quantity of gold in stock would warrant. If that is true, then would not the converse also be true, to wit: under a diminishing supply of the monetary standard, prices would decrease more rapidly than the reduced volume of money would actually warrant?

The deduction from this theory would therefore be that prices in 1896 had dropped below the point justified by relative exchangeable values and that since that time, under the influence of a greatly increased supply of gold, they have increased faster than would be justified by relative exchangeable values. Is it not a fair inference from this that prices will move upward less violently during the next ten years than in the decade just terminated?

It took twenty-three years for prices to drop from 111 in 1873 to 61 in 1896, and if we assume that a corresponding time will be required for the return swing of the pendulum, that would indicate a return to the prices of 1873 by 1919. Now prices had already recovered from 61 to 88 (44%) prior to the panic

of 1907, leaving room for only an advance from 88 to 111 (25%) to bring us back to the high level of 1873.

The above theory may be objected to as being purely fanciful, in that it is not sustained by any computation to show that by 1919 the adverse effects of the withdrawal of silver will have been balanced by an increased supply of gold sufficient to also provide for the increased volume of commodities, naturally to be expected by that time.

A corroborative reason, however, for thinking that prices will now rise more slowly is found in Prof. W. S. Jevons' book "Investigations in Currency and Finance."

ECONOMIC SANCTION FOR THE BELIEF THAT PRICES WILL NOW RISE MORE SLOWLY.

Prof. Jevons says, "In periods of the depreciation of gold, in consequence of its increase in production, the most sudden fall must occur at first and the value of gold will fall more and more slowly as time gets on and the total accumulation of gold grows." For example, if the world's gold stock were \$100,000,000, and \$50,000,000 more were added by production in a year, and other things remained equal, we could expect a rise of 50% in prices. The supply now being \$150,000,000, a following year's production of \$50,000,000 more would increase

the total supply only 33 1-3%, therefore a rise in prices of that amount only would be indicated for the year, and so on.

The quantity theory of gold also involves a quantity theory of commodities. Mulhall's "History of Prices" gives the increased volume of the world's products from 1850 to 1884 at 104%, being an average of 3% per annum. The present visible supply of gold being over seven billion dollars and additions now being made from production of about \$325,000,000 annually (after deducting that used in the arts, etc.), the present rate of increase of the world's supply is therefore only about 5%. Now, if the volume of commodities is also increasing 3% yearly, then the net yearly increase in prices would be only 2%. The depreciation of gold would thus proceed more slowly than in the past ten years, unless indeed a large expansion in production should take place.

It is, of course, impossible to take effectively into consideration all the factors that will arise to influence future prices. The above is therefore submitted not as a prediction that prices will be only 20% higher in 1919 than in 1907, but only to indicate some reasons for believing that the rise will be less violent than that which occurred after 1896 and up to the fall caused by the panic of 1907. From this latter level a rather quick recovery seems to be generally anticipated.

Gold Depreciation

(A Rejoinder.*)

By BYRON W. HOLT.

Of the three fundamental propositions advanced in connection with the problem of gold supply, neither Mr. Conant nor Mr. Cottier have discussed but one. These three propositions are:

1. The gold supply will continue to increase rapidly for many years.
2. Because of this increase and the fact that gold is the standard of value prices of commodities will rise rapidly.
3. Because of rising prices interest rates will average higher than they would if prices were stable.

These propositions contain all that is really debatable in connection with the gold problem. Assuming the truthfulness of these propositions, the more important results, such as the

* This reply to the dissenting views of Mr. Selwyn-Brown, Mr. Conant and Mr. Cottier was specially written for this volume by Mr. Holt.

effect on bond and stock values, on equities in real estate, on speculation, etc., are deducible and reasonably certain.

Neither Mr. Conant nor Mr. Cottier claims that there will not, in the next ten or twenty years, be a tremendous increase in the output and supply of gold. Neither denies that if we have such an increase and if prices of commodities advance rapidly that the average rate of interest will not be high. Apparently their only quarrel is with the idea that a greatly increased supply of gold will cause the average price level of commodities to rise materially from year to year or, at least, from decade to decade. Nor is it clear to what extent they wish to quarrel with this idea.

Mr. Conant freely admits that "The quantity of gold undoubtedly is influential, among other things, upon prices, but among these other things is the state of credit, which at least within short intervals moves prices up and down much more violently than they are moved by changes in the quantity of gold and in the long run defeats any definite calculation as to the separate influence of the quantity of gold."

Admitting that the "state of credit" temporarily and, at times, violently "moves prices up and down," what has this fact to do with the main question? The influence of cheapening gold upon prices continues incessantly regardless of temporary influences of one kind or

another; just as the influence of the moon and sun operates steadily on the earth and causes the tide to rise regardless of the temporary and perhaps violent fluctuations due to waves caused by the "state of the weather."

Besides, has not the supply of gold more to do with the "state of credit" than any other single factor? Is it not certain that the world's unprecedented credit resources of to-day are due primarily to the world's unparalleled stocks of gold in public and private vaults? It is because of our rapidly increasing credit facilities that business revives quickly, after a panic, and proceeds feverishly and speculatively until the credit facilities are again exhausted and relapse follows. Then, when our credit power is re-established—mainly by increased gold reserves—we rush ahead and repeat the speculative cycle. The speculative cycle is due to the effect of rapidly rising prices. If, as in the last decade, prices rise 40% in five years, then decline 6% in one year, then advance 20% in three years, and decline 15% in one year, it is reasonably certain that when prices begin to rise again, as is now the case, there will be a substantial rise in the next two years. Human nature being what it is, manufacturers, merchants and speculators will hasten to take advantage of this prospective rise in prices. Materials and goods will be bought, not entirely for immediate needs, but to carry in stock

while their values are enhancing. A quick revival follows and soon all manufacturing and transportation facilities are taxed to their limits. The demand for new capital soon exhausts the accumulated credits of the world, money gets "tight," prices begin to decline, demand for goods slackens, mills close, railroad earnings decline and industry halts until new credit can be created.

There is nothing in all of this round of industrial and financial events to disprove the so-called quantity theory of gold. No one claims that prices will rise continually, every day, every month and every year, under the influence of cheapening gold. The main claim is that, disregarding temporary fluctuations, average prices will, every three, five or ten years, attain new high levels.

Mr. Conant's statements in regard to declines in the prices of certain articles, because of improved methods of production, about advances in the prices of certain other articles, because of their scarcity or "difficulty in obtaining them" and about some articles being more "sensitive to changes of price" than others, as well as his statement about the "constant inter-related changes" of prices of different commodities without changing their old ratios with each other, are like the flowers that bloom in the spring—"they have nothing to do with the case." To discuss these facts and to

pretend that the truthfulness or falsity of the quantity theory rests upon any or all of them or that it demands a "uniform rise of prices" is to thresh a man of straw. Discussions of this character are beside the question.

To make a fair test the price of no one commodity and of no ten commodities must be considered. Each and all may be exceptional. The average price of all commodities cannot be exceptional. The average price for a month or a year, however, might be exceptional and might not indicate the real tendency and direction of prices. The average price of all commodities for a long period of time must show the trend of prices and this trend must show whether gold is depreciating or appreciating. It cannot be otherwise, for gold is the standard of value by which all other things are measured. It is on one side of the economic scales and all other things are on the opposite scale. When one scale goes down the other scale must go up.

While we talk of the "quantity theory" of money and of products we do not really mean that the relative quantities of any two commodities determines their exchange values. It is not quantity but cost of production that, in the end, determines the exchange values of any two products—wheat with cloth, coal with cotton or corn with gold. If the cost of producing any one commodity is suddenly re-

duced 50%, while the cost of producing other commodities remains the same, the cheapened commodity will, under free competition, tend to sell at half its original price, as compared with the prices of the other commodities. If it be a perishable commodity, such as wheat, cotton, paper or potatoes, it will soon be selling at half its original price. If it be a non-perishable commodity, such as gold or silver, the price, or exchange value, will not change rapidly, and much time will be required to adjust the price to the cost of production. Generally speaking, then, the quantity of a commodity affords a rough measure of its exchange value with other commodities. It is more nearly true of gold than of any other commodity because gold is an almost universal standard of value and medium of exchange, and the demand for it is unlimited. Other things remaining the same, doubling the quantity of gold, then, will double the prices of all commodities, for all are measured by gold.

But other things do not remain the same. It takes time, much time, to double the world's supply of gold. While this is being done, not only is population increasing and civilization expanding, but improvements are cheapening the cost of producing most other commodities. Both processes tend to lower prices and will lower prices constantly if there is no reduction

in the cost of producing the commodity chosen as the standard of value.

To overcome the tendency of prices to decline because of improved methods of production, an increase of something like 2% a year is necessary in the quantity of gold. To counteract the increased demand for gold, due to industrial expansion, a further increase in quantity of perhaps 1% a year is necessary.

Unless, then, the world's supply of gold increases at the rate of about 3% a year, the price level will tend downward.

This fact explains why—taking the figures quoted by Mr. Cottier—prices increased only 200% from 1492 to 1640, while the supply of the precious metals increased 600%. It explains why prices declined materially from 1873 to 1890. During the latter period the supply of gold increased only about 21%. As this was insufficient to offset the natural decline in prices, the price level declined 22% during this period.

Generally speaking, Mr. Cottier's conclusions do not appear to be justified from his facts. He admits that prices rose in Rome when the gold supply increased and that they fell during the "Middle Ages," when "mining practically ceased" and "the quantity of the precious metals in existence had fallen to a minimum." He admits that an "upward swing in prices followed the acquisition by the Spaniards of the

Mexican and Peruvian hoards of precious metals and the development of their mines upon their discovery of America." He admits that another "great upward swing followed the discovery of gold in California and Australia."

After admitting nearly all that is claimed by those who accept the quantity theory of money, he expresses the opinion that, in future, the rise of prices will not be as rapid as in the past ten years. He predicts that "prices will be only 20% higher in 1919 than in 1907."

This would indicate a rise in prices of about 2% a year, which is about all that could be expected when the world's gold supply is increasing only about 5% a year. However, as prices declined about 15%, from the highest point in 1906 to the lowest point in 1907, it is highly probable that we will not have to wait three years to see prices 20% above the low level of 1907. This prediction will be put alongside of Mr. Cottier's.

Another reason for expecting a swift rise in prices in the next five years is due to the abnormally high profits now made in the world's greatest gold mines. In the Robinson Gold Mine—the world's greatest producer—the net profits in 1907 were 71%, and in September, 1908, 77%. In the whole Rand mines—now producing \$150,000,000 of gold a year—the average profits for the first nine months of this year were 42½%. That is, for every \$100,000,000

of gold produced \$42,500,000 are profits. Such profits as these cannot but attract more capital to gold and cause the output and supply of gold to rise rapidly in the next few years. There is reason, then, for supposing that the world's gold supply will increase even more rapidly than at the rate of 5% a year, during the next 10 years, and that prices will rise more than an average of 2% a year for this period. More likely, they will rise an average of 3% or 4% a year.

"The proof of the pudding is in the eating." We will watch the course of prices with great interest for the next few years. Unfortunately we no longer have an accurate and scientific method of tabulating prices. The world met with a very appreciable loss when "Dun's Index Number" was discontinued two years ago.



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